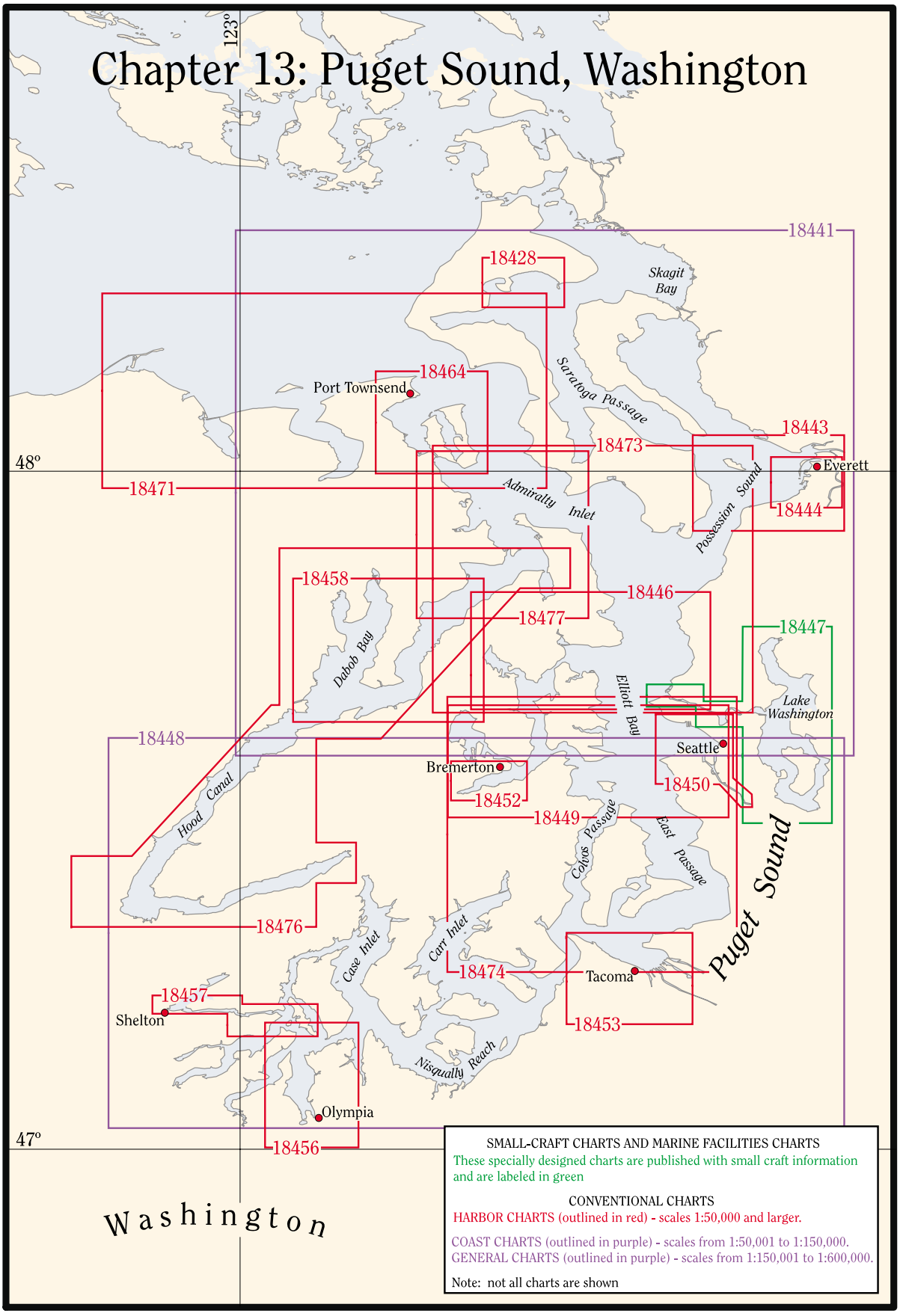
Chapter 13: Puget Sound, Washington
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Skagit Bay
Saratoga Passage
Port Townsend
Everett
Admiralty Inlet
Possession Sound
Dabob Bay
Elliott Bay
Lake Washington
Seattle
Bremerton
Hood Canal
Puget Sound
Colvos Passage
East Passage
Carr Inlet
Case Inlet
Tacoma
Shelton
Nisqually Reach
Olympia
Washington
SMALL-CRAFT CHARTS AND MARINE FACILITIES CHARTS
These specially designed charts are published with small craft information and are labeled in green
CONVENTIONAL CHARTS
HARBOR CHARTS (outlined in red) - scales 1:50,000 and larger.
COAST CHARTS (outlined in purple) - scales from 1:50,001 to 1:150,000.
GENERAL CHARTS (outlined in purple) - scales from 1:150,001 to 1:600,000.
Note: not all charts are shown

Puget Sound, Washington

(1) This chapter describes Puget Sound and its numerous inlets, bays, and passages, and the waters of Hood Canal, Lake Union, and Lake Washington. Also discussed are the ports of Seattle, Tacoma, Everett, and Olympia, as well as other smaller ports and landings.

COLREGS Demarcation Lines

(2) The International Regulations for Preventing Collisions at Sea, 1972 (72 COLREGS) apply on all the waters of Puget Sound and adjacent waters, including Lake Union, Lake Washington, Hood Canal, and all tributaries. (See **80.1395**, chapter 2.)

Chart 18440

(3) **Puget Sound**, a bay with numerous channels and branches, extends about 90 miles S from the Strait of Juan de Fuca to Olympia. The N boundary of the sound is formed, at its main entrance, by a line between Point Wilson on the Quimper Peninsula and Point Partridge on Whidbey Island; at a second entrance between West Point on Whidbey Island, Deception Island, and Sares Head on Fidalgo Island; at a third entrance, at the S end of Swinomish Channel between Fidalgo Island and McGlinn Island. Puget Sound was named by George Vancouver for Lieutenant Peter Puget, who explored the S end in May 1792. Deep-draft traffic is considerable in the larger passages, and small craft operate throughout the area. Unusually deep water and strong currents characterize these waters.

(4) Navigation of the area is comparatively easy in clear weather; the outlying dangers are few and marked by aids. The currents follow the general direction of the channels and have considerable velocity. In thick weather, because of the uncertainty of the currents and the great depths which render soundings useless in many places, strangers are advised to take a pilot.

(5) The **Marine Exchange of Puget Sound**, located in Seattle, has a Vessel Monitoring/Vessel Reporting service which tracks the arrival of a vessel from a time prior to arrival at the pilot station to a berth at one of the Puget Sound ports. Constant updates of the ship's position and estimated time of arrival are maintained through a variety of sources. This information is available to and is passed to the vessel's agents and to other interested activities. These services continue until the vessel passes the pilot station on her outbound voyage.

(6) Other services offered by the Marine Exchange include a daily newsletter about future marine traffic in the Puget Sound area, communication services, and a variety of coordinative and statistical information. The office monitors VHF-FM channels 20 for Grays Harbor traffic, 9 for Strait of Juan de Fuca traffic to Protection Island, and 20 for Puget Sound traffic from Protection Island, 24 hours a day.

(7) **Vessel Traffic Service Puget Sound,** operated by the U.S. Coast Guard, has been established in the Strait of Juan de Fuca, E of Port Angeles, and in the waters of Rosario Strait, Admiralty Inlet, Puget Sound, and the navigable waters adjacent to these areas. (See **161.1 through 161.155,** chapter 2, for regulations, and the beginning of chapter 12 for additional information.)

(8) The Washington State Department of Ecology also requires owners and operators of vessels to submit Safety Reports when a vessel experiences an unusual circumstance. A Safety Report is required for any of the following conditions:

(9) a. Any abnormality or malfunction of any steering, propulsion, or safety system, or navigation systems required by federal or international law or regulation;

(10) b. A breach of hull or the integrity of a cargo or bunker tank that causes or that may reasonably be expected to cause an oil spill or loss of stability;

(11) c. Damage from fire or explosion;

(12) d. An incomplete engineering or deck complement under United States law or regulation under the requirements of the vessel's country of registry; or

(13) e. Any condition that could adversely affect the safety of a vessel, bridge, structure, shore area, or the environment.

(14) A Safety Report must be submitted with an Advance Notice of Entry, or, if the condition occurs after submittal of an ANE the Department must be notified immediately by phone or facsimile of the condition. To inquire or submit vessel information, vessel owners or operators may contact the Washington State Department of Ecology by calling 24 hours, 503-790-4868 (Columbia River and Grays Harbor) or 360-956-8378 (Strait of Juan de Fuca and Puget Sound). Facsimile Safety Reports should be sent to 1-800-664-9184 or 360-407-7288. Cargo, passenger, fishing and tank

vessels are subject to boarding by Washington State Department of Ecology inspectors when in port. Tank vessels are required to have a Tank Vessel Oil Spill Prevention Plan on file with Ecology or must obtain a waiver prior to entering Washington State waters. Washington State also has safe bunkering procedures that must be followed during fuel transfers. For more information contact Ecology by calling 24 hours, 503-790-4868 (Columbia River and Grays Harbor) or 360-956-8378 (Strait of Juan de Fuca and Puget sound). **To report an oil spill call 1-800-258-5990.**

(15) The **U.S. Coast Guard** and the **Puget Sound Harbor Safety Committee** have developed and adopted a Harbor Safety Plan that formally establishes a set of Standards of Care for Puget Sound and surrounding waters. The standards and protocols contained in the **Puget Sound Harbor Safety Plan** complement and supplement existing federal, state, and local laws. The Harbor Safety Plan is not intended to take the place of or otherwise intended to replace the good judgement of a ship's master in the safe operation of his/her vessel. These standards and protocols were developed and adopted by local experts for insuring greater safety. Some sections of the plan provide important safety info for professional mariners transiting Puget Sound, while the Standards of Care formalize and document good marine practice. The Harbor Safety Plan can be obtained by going to the Seattle Marine Exchange website at **www.marineexchangesea.com** or contact (206) 443-3830.

Regulated navigation area

(16) Due to heavy vessel concentrations, the waters of the Strait of Juan de Fuca, the San Juan Islands, the Strait of Georgia, and Puget Sound, and all adjacent waters, are a regulated navigation area. (See **165.1 through 165.13 and 165.1301**, chapter 2, for regulations.)

(17) Floating logs and **deadheads** or **sinkers** may be encountered anywhere in Puget Sound; caution should be exercised.

Anchorages

(18) General, explosives, and foul weather anchorages have been established. (See **110.1 and 110.230**, chapter 2, for limits and regulations.)

Dangers

(19) Restricted areas have been established. (See **334.1200**, chapter 2, for limits and regulations.)

(20) The large tides of Puget Sound are very complex and variable; use of the Tide Tables is advised.

Currents

(21) The Tidal Current Charts, Puget Sound, Northern Part, show the direction and velocity of the tidal current for each hour of its cycle in the waterways of Puget Sound from Admiralty Inlet to Seattle. They are designed for use with the current predictions for Admiralty Inlet contained in the Tidal Current Tables. A similar publication, entitled Tidal Current Charts, Puget Sound, Southern Part, covers the sound from Seattle to Olympia.

(22) In Admiralty Inlet and Puget Sound, the tidal currents are subjected to daily inequalities similar to those of the tides. Velocities of 2 to 7 knots occur from Point Wilson to Point No Point. In the more open waters of the sound S of Point No Point the velocities are much less.

(23) At Point Wilson and at Marrowstone Point, slack water occurs from one-half to 1 hour earlier near shore than in midchannel.

(24) In the winter, when S winds prevail, there is generally a N surface drift which increases the ebb current and decreases the flood current. This effect is about 0.5 knot between Nodule and Bush Points.

(25) The tidal currents in the S entrance of Possession Sound are weak and variable.

(26) Between Foulweather Bluff and Misery Point, the tidal currents have a velocity of about 0.8 knot, while in the S part of Hood Canal, the velocity is only about 0.5 knot; at times of tropic tides, however, the greater ebbs may attain velocities more than double these values.

(27) The tidal currents have velocities up to about 6 knots or more in Agate Passage and in The Narrows.

Weather (Winds and Visibility), Puget Sound

(28) Puget Sound is open to the N and S and protected to the W and E by mountains. Winds are mainly SE through SW from September through April and NW through N in late spring and summer. However, winter directions are still common in summer, as are summer directions in winter. From fall through spring, lows moving through or near the Puget Sound are responsible for the mainly S flow. Intense storms can generate sustained winds of 40 knots with 50-knot gusts over the area. These strong winds are almost always from a S direction. In the Seattle area, sustained winds of 56 knots and gusts of 60 knots have been recorded. Winds are strongest in winter and early spring, on the average. Also, calm conditions are frequent in fall and winter, reflecting the lull between storm passages. In late spring and summer, winds flow into Puget Sound from the Pacific High. Often, winds are light and variable at night, then pick up to 8 to 15 knots during the afternoon, reflecting a sea breeze effect over the sound. Occasionally, a low or front will bring a return to a

Southerly flow during the summer, and these winds remain the strongest, on the average.

(29) Fog in the Puget Sound area causes visibility problems on about 25 to 40 days each year. It most likely hinders navigation in autumn and again during January and February. This fog is mainly a land type that forms on cool, clear, calm nights, drifts out over the water, then dissipates during the day. It can hang on for several days if a stagnant condition develops. Fog can form in any month, but is least likely during May, June, and July.

(30) Poor visibilities are encountered more often N and S of Puget Sound than in the sound itself. In Admiralty Inlet, fog signals at Point Wilson and Double Bluff and Point No Point blow about 8 to 15 percent of the time, during the late summer and fall. Fog lowers visibilities on this part of the coast to less than 0.5 mile (0.9 km) on about 4 to 8 days per month. South of Point Robinson, in the East Passage, the fog signals operate about 8 to 15 percent of the time in fall and mid-winter. In Puget Sound, fog signals, even during the heart of the season, blow less than 8 percent of the time; less than 5 percent in Elliot Bay. Waters of Point Wells and Three Tree Point are among the most fog free in the area; fog signals there operate just a few hours a month for most of the year. In the Seattle area, visibility falls below 0.5 mile (0.9 km) on about 3 to 6 days per month during the foggy season.

Charts 18471, 18464

(31) **Point Wilson** is the W point to Admiralty Inlet and Puget Sound.

(32) **Point Wilson Light** (48°08'39"N., 122°45'17"W.), 51 feet above the water, is shown from a white octagonal tower on a building on the E extremity of the low point. A fog signal is at the light.

(33) Shoals extend 0.5 mile NW of Point Wilson to the 5-fathom curve over irregular bottom; these are generally indicated by kelp. The E edge of the shoals rises rather abruptly from deep water. Heavy tide rips extend N of these shoals, being especially heavy with a W wind and ebb current. A buoy marking the shoals is about 0.7 mile NW of Point Wilson Light.

(34) In approaching Point Wilson in thick or foggy weather, especially if the fog signal is not heard, vessels should obtain soundings constantly.

(35) **Fort Worden State Park,** formerly an Army base, is about 0.8 mile SSW of Point Wilson. An unused 438-foot pier, with reported depths of 14 feet and shoaling along the face, is in good condition. A launching ramp is just N of the pier.

(36) **Port Townsend,** immediately S of Point Wilson, is entered between Point Hudson and Marrowstone Point. It extends in a general SSW direction for 2.5 miles, and then turns SSE for 3 miles, with a reduced width to its head. Inside Point Hudson, depths generally range from 5 to 20 fathoms. It is an excellent harbor and is easily entered, however, mariners are warned to be aware of strong side currents that exist in Admiralty Inlet. The prevailing winds in summer are from W to SW, and in winter are generally in the SE quadrant.

(37) **Point Hudson,** on the W shore 1.7 miles SSE of Point Wilson, is low and sandy. It is marked by a light and fog signal. The outer limits of the shoal making out from the point are marked by a lighted bell buoy NE of the light.

(38) **Marrowstone Point,** the E point at the entrance to Port Townsend, is low at its extremity, but rises abruptly to a bluff about 120 feet high. The buildings of the former Fort Flagler, now a recreation area of the Washington Parks system, are about 0.5 mile to the S. The fort pier, with depths of about 20 feet at its face, is in poor condition. A fish haven is near the pier in about 48°05'28"N. 122°41'23"W. **Marrowstone Point Light** (48°06'06"N., 122°41'16"W.), 28 feet above the water, is shown from a 20-foot white square structure on the E edge of the point; a fog signal is at the light. Piling of former piers and anchor piling for wartime submarine nets extend up to 500 yards offshore 0.6 and 1.6 miles W of the light.

(39) **Midchannel Bank,** covered 4¾ to 10 fathoms, extends NW from Marrowstone Point about 2 miles toward Point Wilson. The bank has several submerged obstructions and large boulders on the bottom. Due to the nature of the bottom and the existence of cross currents from Admiralty Inlet, the bank is unsuitable for safe anchorage.

(40) **Port Townsend,** the principal town, is on the W shore immediately W of Point Hudson. The depths at the wharves range from 8 to 30 feet along the faces. The only commercial traffic, other than fishing boats and ferries, is at Port Townsend Paper Corporation papermill SW of the town at Glen Cove.

Anchorage

(41) The usual anchorage is about 0.5 to 0.7 mile S of the railroad ferry landing in 8 to 10 fathoms, muddy bottom. In S gales better anchorage is afforded closer inshore off the N end of Marrowstone Island or near the head of the bay in moderate depths, muddy bottom. Two **explosives anchorages** are in the bay. (See **110.1 and 110.230,** chapter 2, for limits and regulations.)

Tides

(42) The mean range of tide at Port Townsend is 5.2 feet, and the diurnal range of tide is 8.4 feet. Because of the large daily inequality in this vicinity there may be only one high water and one low water a day. Reference should be made to the Tide Tables which give daily tide predictions for Port Townsend.

Pilotage, Puget Sound

(43) Pilotage is compulsory for all vessels except those under enrollment or engaged exclusively in the coasting trade on the W coast of the continental United States (including Alaska) and/or British Columbia. Pilotage for Puget Sound is provided by the **Puget Sound Pilots.** (See Pilotage, Strait of Juan de Fuca and Puget Sound, indexed as such, chapter 12, for detail.)

Towage

(44) Tugs are not available at Port Townsend, but may be obtained on advance notice from Port Angeles or Seattle through ships' agents.

Quarantine, customs, immigration, and agricultural quarantine

(45) (See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

(46) **Quarantine** is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

(47) Port Townsend is a **customs port of entry.**

(48) The graystone Custom House-Post Office Building, built in 1893, is conspicuous on the bluff overlooking the waterfront. This building was the customs headquarters for Puget Sound until 1913, when headquarters was moved to Seattle. Deep-draft vessels and tugs are inspected alongside the pulpmill wharf. Small craft report their arrival by telephone (1-800-562-5943).

(49) **Point Hudson Harbor,** just W of Point Hudson, is leased by the Port of Port Townsend to a private company. The entrance, protected by jetties, is marked by a private light on the end of the S jetty. About 100 small-craft berths, electricity, water, pump-out station, launching ramp, and a 25-ton lift are available. Hull and engine repairs for small craft can be made. Reported depths of 9 feet were available in the approach to the harbor, with 12 feet alongside the berths. The town business district is adjacent to the harbor.

(50) The terminus of the Port Townsend-Keystone ferry is 0.4 mile WSW of Point Hudson Harbor.

(51) **Port Townsend Boat Haven,** 1.1 miles SW from Point Hudson, is operated by the Port of Port Townsend. The entrance is marked by lights; in July 2000, the controlling depths were 11.3 feet in the entrance channel and 10 to 12 feet in the basins. There are floats for about 600 small craft. A seafood packing company and several boat building and boat repair firms are at the basin. Electricity, gasoline, diesel fuel, water, ice, marine supplies, winter dry boat storage, and a pumpout station are available. Three travel lifts with 60, 70, and 300-ton capacities are at the basin for launching and hauling out vessels. A launching ramp is at the NW end of the basin.

Supplies

(52) Gasoline and diesel are available at Port Townsend Boat Haven. Water, ice, groceries, marine supplies are available at these facilities and in the town.

Repairs

(53) Only minor above-the-waterline repairs can be made to large vessels. Travel lifts to 300 tons are available at Port Townsend Boat Haven; a 20-ton travel lift is at Point Hudson Harbor. Hull, engine, and electronic repairs can be made.

Communications

(54) A passenger and automobile ferry operates between Port Townsend and Keystone Harbor, just E of Admiralty Head, Whidbey Island. Another ferryboat operates between Port Townsend, Victoria, B.C., Friday Harbor, and Seattle from late April through mid-October.

(55) **Glen Cove,** about 2.2 miles SW of Point Hudson, is the site of the Port Townsend papermill, at the N end of the cove. The 480-foot-long pier has reported depths of 30 feet alongside and a deck height of 18 feet. A private light and fog signal, on the seaward end of the pier, are maintained by the mill. A slight current may be encountered, and the use of an anchor is recommended in docking. Fuel oil tankers use the N side of the wharf; paper products are shipped from the S side. The large white building and tall stacks of the mill are prominent, as is the smoke.

(56) A naval restricted area is in the E part of the harbor off **Walan Point** (48°04'18"N., 122°44'47"W.). (See **334.1270**, chapter 2, for limits and regulations.)

(57) **Irondale,** on the W shore about 1.5 miles from the head of the bay, is the site of a former iron foundry. Shoal water extends nearly 0.3 mile from the shore at this place. Log booms extend N 0.8 mile to **Kala Point,** which is marked by a light.

(58) **Port Hadlock,** a village at the head of the harbor, has landings with depths of 10 and 12 feet. The Port of Port Townsend maintains a mooring float during the summer. Gasoline is available in the town. Submerged pilings are in the vicinity of the mooring float, and local knowledge is necessary to avoid them.

(59) A marina, 0.4 mile SW of the N entrance to Port Townsend Canal, has berths for over 155 craft; water and electricity are available.

(60) **Port Townsend Canal,** a dredged passage giving access to Oak Bay to the SE, is subject to considerable shoaling. In September 1995, the controlling depth was 13 feet. The S entrance is jettied; a light and daybeacon mark the S entrance. A light is at the N entrance.

(61) Currents through the canal are strong at times, although there is no particular danger from them as the channel is wide and straight; there are, however, strong eddies at the S end on the ebb current.

(62) The canal is crossed by a fixed highway bridge with a clearance of 58 feet. Power cables nearby have clearances of 90 feet. (See **162.235,** chapter 2, for rules, regulations, and use of the canal.)

(63) **Kilisut Harbor,** between **Indian Island** on the W and **Marrowstone Island** on the E, is a narrow inlet extending about 4 miles in a SSE direction. A Navy ammunition depot is on Indian Island. The entrance to Kilisut Harbor is 2.5 miles WSW of Marrowstone Point. The entrance channel is winding. In October 1981, a reported depth of 5 feet was in the entrance channel. A submerged pile is N of the entrance in about 48°05'13"N., 122°44'24"W.; caution is advised when approaching Kilisut Harbor from N. **Fort Flagler State Park** is on the NE side of the entrance channel. Two boat ramps and a small-craft float are at the park. Water is available. Inside the harbor is good anchorage in 4 to 5 fathoms. At the S end of the harbor the two islands are connected by an earth-filled causeway and narrow strip of beach. The village of **Nordland** is on the E side of **Mystery Bay,** a small shallow cove midway on the E side of Kilisut Harbor. A small-craft float is maintained in the cove by the Washington State Park System. Water and pump-out station are available. The short pier of an oyster company is just SE of the State Park float. The head of the cove is used as a log dump. Caution should be exercised to avoid two concrete blocks located 20 to 30 feet off the E end of the State Park pier.

Charts 18441, 18471, 18477

(64) **Admiralty Inlet** extends from the Strait of Juan de Fuca to Foulweather Bluff. A **naval restricted area** is at the N entrance of Admiralty Inlet, extending W and NW from Admiralty Head. (See **334.1210**, chapter 2, for limits and regulations.)

(65) **Admiralty Head,** 80 feet high, on Whidbey Island, is the E entrance point of Admiralty Inlet and the SE extremity of a succession of light bare bluffs which extend N of Point Partridge, where they attain their highest elevation. About 0.5 mile N of Admiralty Head an abandoned lighthouse tower 39 feet high stands on top of a bluff.

(66) **Admiralty Bay,** E of Admiralty Head, is used only occasionally as an anchorage as it is exposed to SW winds and has a hard bottom and strong currents.

(67) **Keystone Harbor** (see also chart 18464) is entered through a dredged channel just NE of Admiralty Head. A state ferry landing is at the head of the harbor. This landing is the Whidbey Island terminus of the passenger and automobile ferry that operates to Port Townsend. In May 2001, the controlling depth in the dredged entrance channel was 19 feet, thence depths were 17 to 22 feet in the middle of the harbor basin with much lesser depths along the sides. A breakwater, marked by a light, protects the E side of the entrance. A private light on a concrete pile marks the W side of the entrance. A launching ramp is on the E side of the harbor.

(68) A tall, narrow, grayish green tank is prominent on **Lagoon Point,** 5.5 miles SSE of Admiralty Head.

(69) **Bush Point,** 8 miles SSE of Admiralty Head, is marked by a light at the end of a low sandspit. Back of the spit the land shows as a low timbered point from N or S. The flood current is reported to set strongly toward Bush Point. In July 1983, Puget Sound Traffic Lane Separation Lighted Buoy SC, about 1.1 miles W of Bush Point, was reported to submerge during periods of strong currents. Tidal Current Charts for this area should be consulted. Several rocks lie nearly 0.2 mile offshore 1.1 miles SE of Bush Point.

(70) **Oak Bay** is a cove on the W side of Admiralty Inlet, W of the S ends of Marrowstone and Indian Islands. A 1½-fathom shoal, marked by a buoy, extends S of the E entrance point.

(71) **Mutiny Bay,** between Bush Point and Double Bluff, affords temporary anchorage near the center in 10 to 20 fathoms. This anchorage is useful if overtaken by fog. The extremities are clay bluffs, and the center is low with extensive flats. Several sport fishing resorts are in the bay. Some have marine railways and can make minor repairs to outboard engines, and most have gasoline, water, and ice. Strong tide rips, at times dangerous for small craft, occur off Double Bluff, particularly on the ebb with strong NW winds. There is frequently an eddy in Mutiny Bay; tidal current charts should be consulted.

(72) **Double Bluff,** marked by a light, consists of bare, white cliffs, 300 to 400 feet high on its SE face, but much lower on its NW face. A lighted buoy marks the extremity of the shoals 600 yards W of the bluff. The shoals are usually marked by kelp.

Chart 18477

(73) **Foulweather Bluff**, on the E side of the entrance to Hood Canal, is one of the most prominent cliffs in Puget Sound. The N face, which is bare, is 0.5 mile broad and consists of vertical, grayish sand and clay bluffs, 225 feet high, sloping off on the E side to a bluff 40 feet high, but on the Hood Canal side the point is steep and high. A marsh, enclosed by a sandspit and marked by a light, extends about 500 yards from the base of the bluff on the Hood Canal side. The top of the bluff is fir and underbrush. There are several boulders which bare within 100 yards N of the highest part of the bluff, and a shoal covered 2 to 18 feet extends 200 yards E from the extremity and in line with the face of the bluff. If overtaken by fog, a vessel can find temporary anchorage 0.5 mile N of Foulweather Bluff, in not less than 60 feet. A lighted bell buoy marks the shoal 0.4 mile N of the bluff.

(74) At times the tide rips N of and around Foulweather Bluff are sufficiently heavy to be dangerous to small craft and to break up log rafts. This is most dangerous when the ebb current from the main body of Puget Sound meets that of Hood Canal off the point, and particularly so with the ebb against a strong N or NW wind.

(75) **Klas Rock,** 0.2 mile from the W shore and 0.7 mile SSE of **Olele Point,** marks the entrance to Mats Mats Bay to the W and to **Port Ludlow** to the S. It is of small extent and awash at high water. The rock, marked by kelp, is surrounded by deep water with depths up to 100 feet between it and the shore. Klas Rock is marked on the E side by a lighted bell buoy.

(76) **Mats Mats Bay,** SW of Klas Rock, is a small, nearly landlocked lagoon offering excellent protection from the wind to small craft. The entrance to the bay is about 100 yards wide at high water. A dredged channel, marked by a **261°15'** lighted range, buoys, and lights, leads from the entrance to the NE corner of the bay. In June 1977, the controlling depth in the entrance channel was 5 feet for a midwidth of 100 feet. Good anchorage may be had in the bay with general depths of 4 to 12 feet.

(77) A boat ramp and 200 feet of transient moorage, maintained by the Port of Port Townsend, are on the SE side of the bay.

(78) The three **Colvos Rocks,** 0.7 mile S of Klas Rock and about 0.3 mile off the W shore, mark the N extremity of the bank covered by 7 to 28 feet which extends in an arc S to **Tala Point.** The NW rock, 28 feet high and of small extent with deep water around it, is marked by a light. The SE point of the shoal extending SE from the rocks is marked by a buoy. Tala Point is a bluff, wooded, and about 310 feet high. A light is about 200 yards NE of the point.

(79) **Snake Rock** is 0.4 mile SW of the W Colvos Rock and 300 yards offshore.

(80) The entrance to **Port Ludlow,** in the W part of Admiralty Inlet, is just W of Colvos Rocks on the W side at the entrance to Hood Canal. From the broad entrance the bay extends in a general S direction 2.5 miles, terminating in a basin 0.5 mile in diameter. The basin affords good anchorage in 40 to 50 feet, soft bottom; the shores are fairly steep.

(81) **Burner Point**, marked by a light, is on the N side of the entrance to the inner portion of the bay. A **speed limit** of 5 knots is enforced southerly of a line extending due east from Burner Point to the east shore.

(82) The town of **Port Ludlow**, once a major Puget Sound lumber port, is on the N shore of the inner portion of the bay. The former Port Ludlow townsite is now occupied by a housing development and resort of the same name. A series of exposed piles are on the NW side of the inner bay. Several private small-craft floats are in the bay.

(83) A marina, on the N side of the bay and just W of Burner Point, has berths for nearly 300 craft; electricity, gasoline, diesel fuel, water, ice, and some marine supplies are available. Reported depths of 16 feet can be taken to the floats. The entrance to the fuel dock is reported to shoal on the right side at low tide.

(84) **The Twins** are two islands at the extreme SW end of Port Ludlow. The small bay S of The Twins is sometimes used as an anchorage for small craft in rough weather. A reported depth of 10 feet is in the entrance to the bay between the islands.

(85) **Hansville,** about 2.5 miles ESE of Foulweather Bluff, is a small village with stores and several waterfront resorts. Berthage is not available; however, two of the resorts have marine railways and 2-ton hoists that can handle craft up to 19 feet. Water and ice are available. During the fishing season, many purse seiners operate just off the beach in the Hansville area.

(86) **Norwegian Point,** low and rounding, is about 0.2 mile NW of Hansville. A conspicuous privately owned lighthouse, 210 feet above the water and built from plans of the original lighthouse at Mukilteo, is about 1 mile W of Hansville.

(87) **Point No Point,** on the W shore of the sound about 3.5 miles SE of Foulweather Bluff, is a low sandspit. **Point No Point Light** (47°54'44"N., 122°31'37"W.), 27 feet above the water, is shown from a 20-foot white octagonal tower on the end of the point; a fog signal is at the station.

Chart 18441

(88) **Useless Bay**, indenting Whidbey Island E of Double Bluff, is open to the SW. The shores are bluff, brush covered, and low with a marshy area surrounding the bay. The N and SE sides of the bay are spotted with homes. At night, the lighted antenna about 2 miles NE of the head of Useless Bay is prominent.

(89) **Scatchet Head** and **Possession Point,** at the S end of Whidbey Island, are both prominent, especially from S; the white bluffs are visible for a considerable distance. A lighted bell buoy is 0.5 mile S of Possession Point. A fish haven is close W of the lighted bell buoy. Shoals extend 0.5 mile offshore immediately W of Scatchet Head and over 0.2 mile offshore from the head to Possession Point. A lighted gong buoy is about 0.5 mile off Scatchet Head. **Cultus Bay,** just W of Possession Point, is shoal; much of the bay bares at low water. A channel, marked by private buoys and daybeacons, leads to a private mooring basin on the E side of the bay. The channel has a reported depth of 3 feet. A mooring float and launching ramp are just N of the mooring basin on the E side of the bay.

(90) Possession Sound and its tributaries are described later in this chapter.

Charts 18446, 18473

(91) **Apple Cove Point** is a low sandspit projecting 220 yards from the high, wooded land of the peninsula. The point is steep-to, but a shoal makes out nearly 0.5 mile SE from it. Just off the point is a light. Heavy tide rips caused by strong NW winds and a strong ebb current are encountered in the vicinity of the light.

(92) A microwave tower on the high ground about 0.6 mile SW from Apple Cove Point Light, is prominent from offshore.

(93) **Appletree Cove** is the open bight on the W side of the sound about 1.5 miles S of Apple Cove Point. It affords anchorage in 30 to 60 feet inside the line of the entrance points, with some shelter from winds drawing in or out of the sound, but not from N and SE. Shoaling to 18 feet exists about 0.2 mile S to SE of the end of Kingston breakwater.

(94) **Kingston,** a town on the N side of the cove, has a large, well-equipped small-craft basin, a 420-foot long fishing pier, and a pier with a ferry slip at its end. The ferry runs between Kingston and Edmonds. The basin is used by tugs, fishing boats, and pleasure craft. The harbor is protected by a stone breakwater that extends about 340 yards SW from the ferry pier; the end of the breakwater is marked by a light. In March 2001, the reported controlling depth was 11 feet through the entrance and in the E part of the basin with 8½ feet in the W part of the basin. Berths for 275 craft, electricity, gasoline, diesel fuel, water, ice, pump-out station, and marine supplies are available. Hull and engine repairs can be made. In July 1999, the channel was reported as no longer being maintained.

(95) **Edwards Point** is a high, wooded point on the E side of Puget Sound 3.6 miles ESE of Apple Cove Point. It is a turning point for vessels running from Seattle N into Possession Sound and adjoining waters.

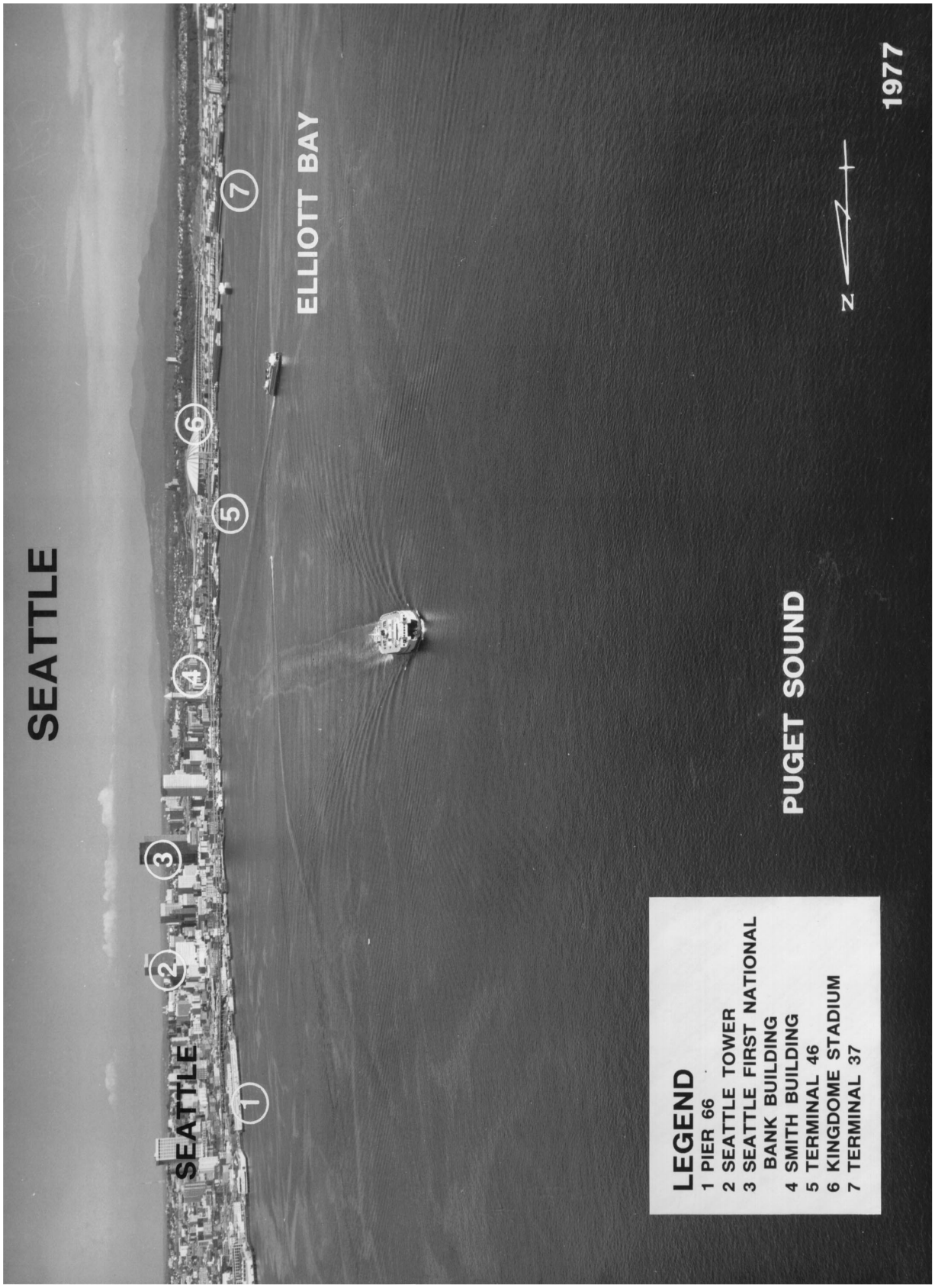
(96) **Edmonds** is an incorporated city 1 mile NE of Edwards Point with a small boat basin and marina under the administration of the **Port of Edmonds.** The basin, protected on its N, W, and S sides by a breakwater, is entered from the W at about midpoint of the W section of the breakwater. The breakwater is marked by lights. In May 1985, the reported midchannel controlling depth was 12 feet through the entrance; thence in June 1999, there was a reported depth of 9 feet inside the marina with lesser depths at the sides. Open and covered berths for about 800 craft to 50 feet, including 50 transient berths, are available. Berth assignments are made by the **harbormaster.** Electricity, gasoline, diesel fuel, water, ice, pumpout station, and a 35-ton travel lift are available in the basin. A boatyard is also available for minor hull and engine repairs.

(97) Just N of the boat basin are a fish haven and fishing pier, the Edmonds and Kingston ferry landing, and a scuba diving area N of the landing. The fish haven is marked by private buoys near the boat basin breakwater N section; private buoys also mark the W side of the scuba diving area.

(98) A **037°01'-217°01' measured nautical mile** is on the shoreline 1 mile NE of Edmonds. The front markers are on short metal poles atop the seawall which protects the railroad tracks; the rear markers are about 20 yards SE of the front markers. The bluff is 60 feet high behind the NE pair of markers and 12 feet high behind the SE pair of markers. All four markers are white wooden triangular daymarks.

(99) **Point Wells** is a low, sandy point projecting 450 yards from the high land 1.5 miles S of Edwards Point on the E side of the sound. It is distinguished by prominent oil tanks. It is a water terminal and storage plant of Chevron USA, Inc. There are two wharves here, however, only the S wharf is in use. The wharf is 1,054 feet long and has a deck height of 21 feet. In May 1983, reported depths of 40 to 70 feet were alongside. A conveyor serving this wharf is used for outloading drummed petroleum products. Barges are loaded on the inside of both the N and S extensions of the wharf.

(100) The current at Point Wells is unpredictable being inconsistent for similar tidal conditions; however, a vessel making a port landing on a flood tide may expect to be set off the pier. The use of an anchor is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4 SMITH BUILDING
5 TERMINAL 46
6 KINGDOME STADIUM
7 TERMINAL 37
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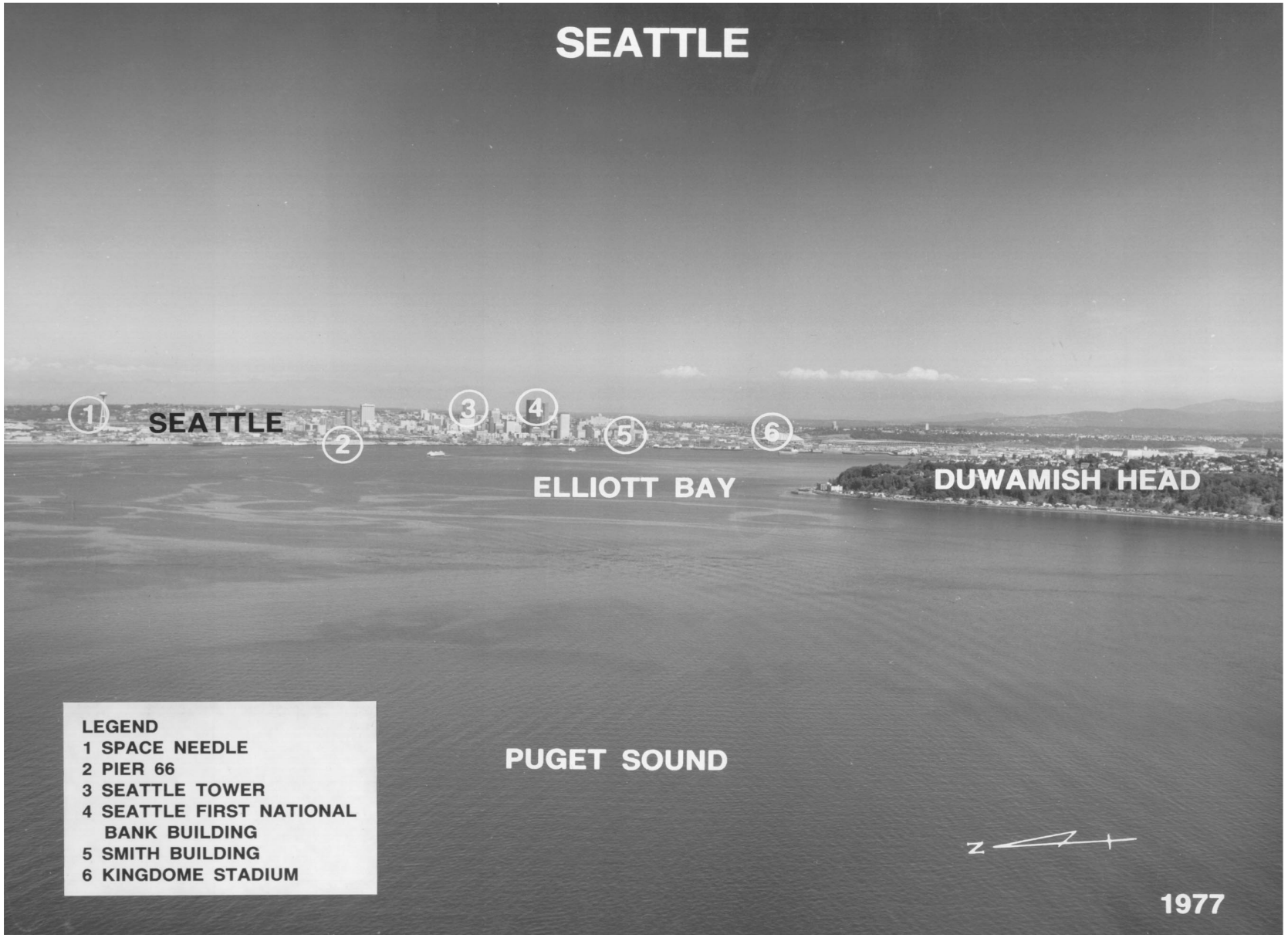
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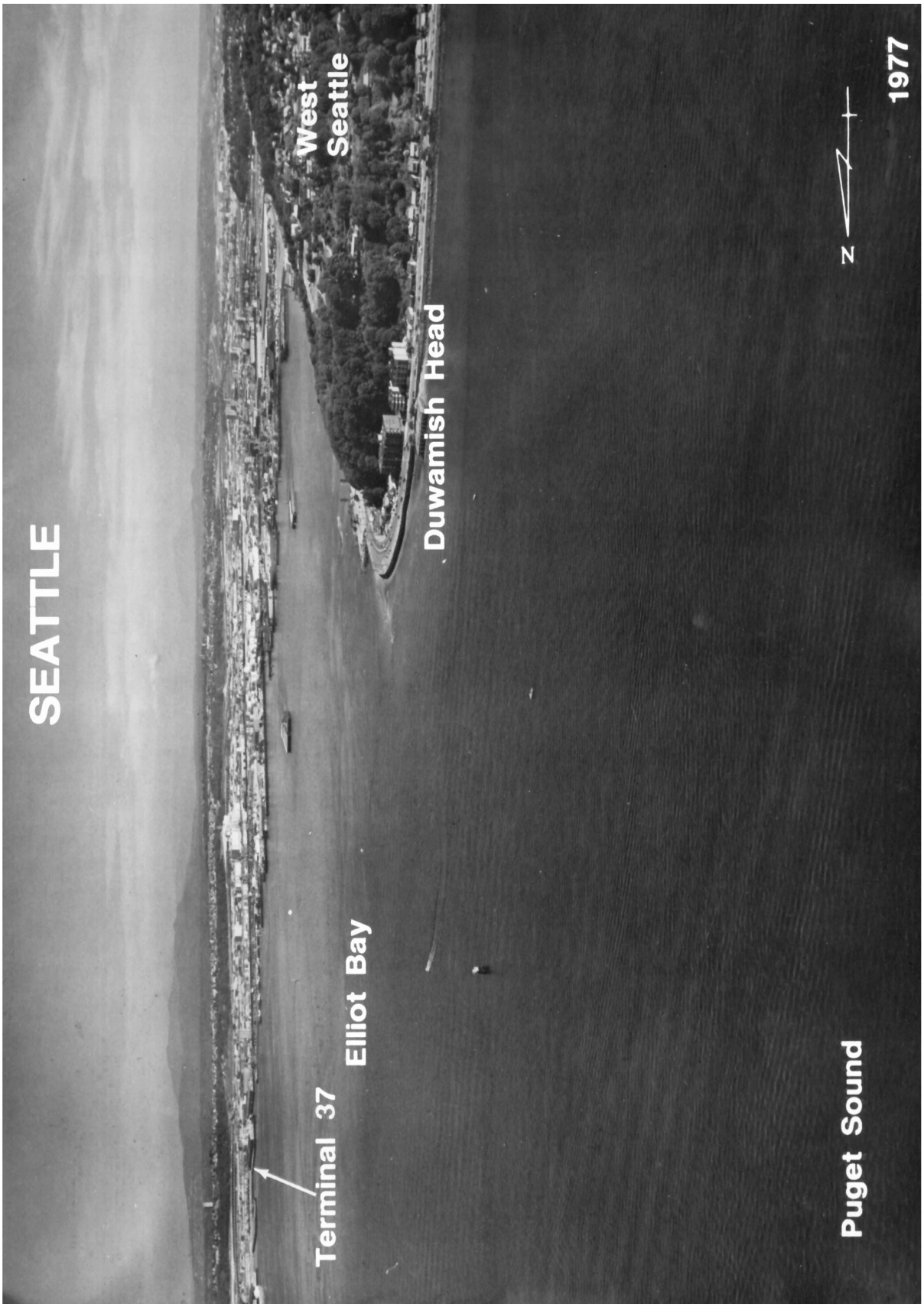
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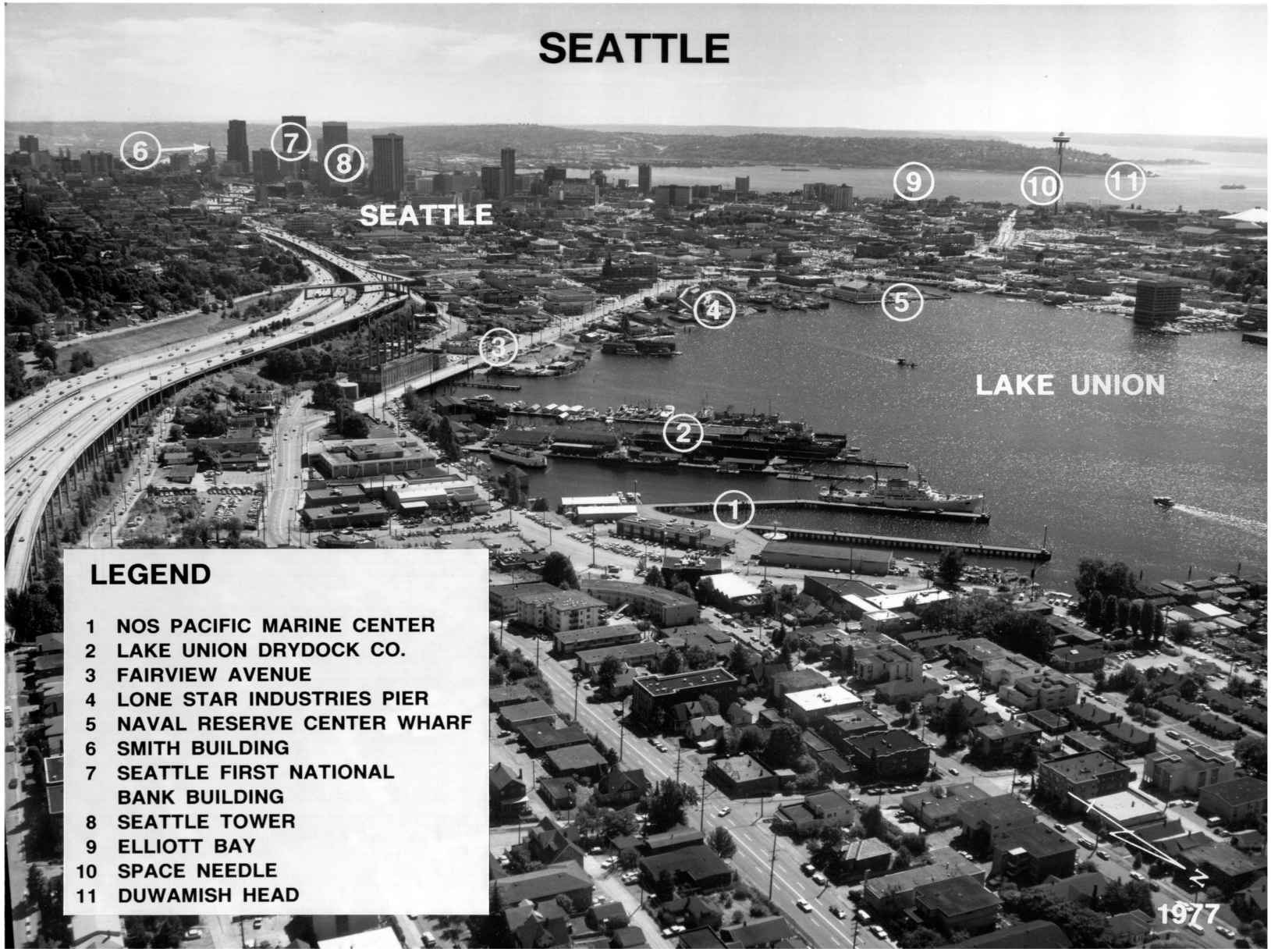
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2 LAKE UNION DRYDOCK CO.
3 FAIRVIEW AVENUE
4 LONE STAR INDUSTRIES PIER
5 NAVAL RESERVE CENTER WHARF
6 SMITH BUILDING
7 SEATTLE FIRST NATIONAL BANK BUILDING
8 SEATTLE TOWER
9 ELLIOTT BAY
10 SPACE NEEDLE
11 DUWAMISH HEAD

recommended when docking in high wind. The Manager of the Marine Department of Chevron USA, Inc. prefers that vessels not be docked without the use of tugs when conditions are such that damage might be done to the wharf. Deep-draft vessels approaching the wharf for a starboard landing during a flood tide must guard against being set on to the shoal S of the wharf. The lighted range on the point is used to clear the shoals N of the N wharf. A company-maintained fog signal is on the S wharf.

(101) **Richmond Beach** is a community on the E shore just S of Point Wells. A tall, charted radio tower (KCIS), marked by aircraft warning lights, is about 1.5 miles inshore from Richmond Beach; it is an excellent landmark, especially at night. A fish haven, marked by a private unlighted buoy, is off the mouth of **Boeing Creek,** about 1.9 miles S of Point Wells.

Charts 18446, 18449

(102) **Bainbridge Island**, 9 miles long and heavily wooded, forms part of the W shore of Puget Sound. There are several towns on the island.

(103) **Port Madison** indents the W shore between the N end of Bainbridge Island and **Point Jefferson.** It is about 2.5 miles long and very deep; not until within 0.5 mile of the beach can anchorage be found in 90 to 100 feet, sticky bottom. Its SW part connects with Port Orchard through Agate Passage.

(104) The N shore is formed by broken white bluffs, with low beaches between, and bordered by sand and shingle beaches that bare in some cases as much a 0.2 mile offshore. **Indianola**, a village on the N shore, has a long pier. The water E of the end of the pier is shoal. The bluffs on the W shore are moderately low; the buildings of the small town of **Suquamish** near the entrance to Agate Pass are prominent.

(105) **Miller Bay,** in the NW part of Port Madison, is used by shallow-draft pleasure craft. The channel should not be used at low tide because of the very irregular bottom. In 2002, the reported depth in the channel along the docks at the S end of the bay was 5 feet.

(106) **Point Monroe,** the S point at the entrance of Port Madison, is a low, narrow sandspit, curving W and S and marked by a light and daybeacon. A small cove is between the sandspit and the shore to the S. The entrance dries at low water.

(107) The S shore of Port Madison is composed of broken bluffs, except where it is indented by the narrow arm extending 1 mile S. The entrance to this narrow arm is 0.7 mile W of Point Monroe Light. The town of **Port Madison,** has many private piers but no fueling facilities. The narrow channel through the arm has a least depth of about 14 feet, and local knowledge is necessary to keep in the best water. A submerged rock, covered 6 feet and marked by a daybeacon (47°41'51"N., 122°32'07"W.), about 220 yards SSW of **Treasure Island;** caution should be exercised. An old ballast dump, nearly bare at low water, is 75 yards offshore 400 yards in from the E entrance point. Care should be taken to avoid the cluster of covered rocks 100 yards off the E entrance point. Sheltered anchorage for small craft may be had in up to 21 feet, mud bottom.

(108) **Meadow Point,** on the E side of Puget Sound nearly opposite Point Monroe, is a low, grassy point, with a high tree and brush-covered bluff behind it. A buoy is about 550 yards NW of the point.

(109) **Murden Cove** is an open bight on the W side of the sound about 3.5 miles S of Point Monroe. An extensive flat which bares extends almost 0.5 mile from the head of the cove, and outside of it the depth increases rapidly. **Skiff Point,** the N entrance point, has low yellow bluffs to the S. A shoal, covered by kelp, extends about 250 yards from the point; this shoal is reported to be building out and should be given a wide berth. **Yeomalt Point,** the S entrance point, is a low, grassy sandspit, 150 yards wide, rising gradually to the general level of the high land. The radio towers about 0.9 mile SW of Skiff Point are prominent from offshore.

(110) **Wing Point,** on the N side of the entrance to Eagle Harbor, is a narrow, bluff point 30 feet high, covered with trees to the edge. A flag pole is prominent on the point. A reef extends SSE for 0.5 mile from Wing Point and is generally marked by kelp. The S extremity of the reef is marked by a buoy. **Tyee Shoal,** 0.7 mile SSE of Wing Point, with a least depth of 15 feet, is marked by a light with a fog signal.

(111) Foul ground extends as much as 500 yards off the S point at the entrance; a light and buoy mark its outer limits.

(112) **Eagle Harbor** indents the E shore of Bainbridge Island opposite Elliott Bay. It is 2 miles long and affords excellent anchorage in 30 to 39 feet, muddy bottom. It narrows at the head to 300 yards.

(113) The entrance is deep, but caution is necessary in entering because the natural channel is only 200 yards wide between the reef S of Wing Point and the spit on the W side of the channel entrance. The channel is marked by lights and buoys.

(114) **Winslow** is the largest town on Bainbridge Island. It is on the N shore of Eagle Harbor, and is a major ferry port on the cross-sound routes to and from downtown Seattle. About 0.2 mile W of the ferry slip is a large building and two piers which are used by the Washington State Ferry System for ferry mooring and maintenance. About 0.3 mile West of the ferry slip is a city park

with a float that offers 48-hour free moorage. Immediately W of the float is a launching ramp.

(115) There are several marinas located on the shores of Eagle Harbor. Numerous small-craft are anchored in the upper half of Eagle Harbor.

(116) **Creosote,** a low flat extending 350 yards inland, then rising abruptly to over 200 feet, is on the S side to the entrance of Eagle Harbor. Ships formerly loaded creosoted lumber at the wharf. Two lights and a buoy mark shoals to the NW and E. **Eagledale,** is a small town with three marinas, on the S shore about 0.5 mile W of Creosote.

(117) **Blakely Rock,** the highest of four rocks, is prominent in approaching Blakely Harbor; it is 0.7 mile N of Restoration Point and at high water shows about 15 feet at its highest point. It is 300 yards long, with shoal water, well marked by kelp, extending over 250 yards N. A light is on the S side of the rock.

(118) **Blakely Harbor** is a small inlet on the E shore of Bainbridge Island near its S end. It is 1 mile long. Depths range from 145 feet at the entrance to 25 feet near the head. The usual anchorage is near the entrance in 54 to 96 feet, sticky bottom, slightly favoring the S shore. There are many old pilings and dolphins in the shoal waters near the shores. There are no usable wharves in Blakely Harbor. One of the world's largest sawmills once operated here.

(119) **Restoration Point** is flat and about 10 feet high for 300 yards from the shore, then it rises abruptly to a wooded knoll about 100 feet high, on which a flagpole and a number of large buildings are prominent. **Decatur Reef,** partly bare, extends 300 yards E of Restoration Point. The outer end of the reef is marked by a light.

Charts 18449, 18446, 18447, 18474

(120) **Shilshole Bay** is between Meadow Point and West Point. It is an open bight from which the Lake Washington Ship Canal is entered, and is the site of the largest marina in the Seattle area. Clay cliffs extend for about 0.5 mile S of the canal entrance. Golden Gardens Park, Seattle Department of Parks and Recreation is N of the marina and extends up to and includes Meadow Point.

(121) **Shilshole Bay Marina,** the small-craft basin just N of the canal entrance, is administered by the Port of Seattle. A 4,400-foot breakwater, marked at each end by a light, protects the basin on its W side. The basin has two entrances. In June 1998, the reported controlling depths were 15 feet in the N and S entrances, depths alongside the floats in the basin were about 10 feet.

(122) There are berths at the concrete floats for 1,500 craft of up to 130 feet long, including a guest pier and transient berths. Electricity, gasoline, diesel fuel, water, ice, marine supplies, and a pumpout station are available at the 600-foot pier at the midpoint of the basin at the propane storage facility on Pier A. All berths have electricity and water. Two 3-ton hoists are at the S end, and one 3-ton and one 4-ton hoists are at the N end of the basin. A 35-ton Marine Travel Lift, for haulout, is available at the boatyard at the S end of the basin. Dry storage is available for 74 boats on movable trailers at the N end of the marina. A boat launching ramp is located immediately N of the marina in Golden Gardens Park.

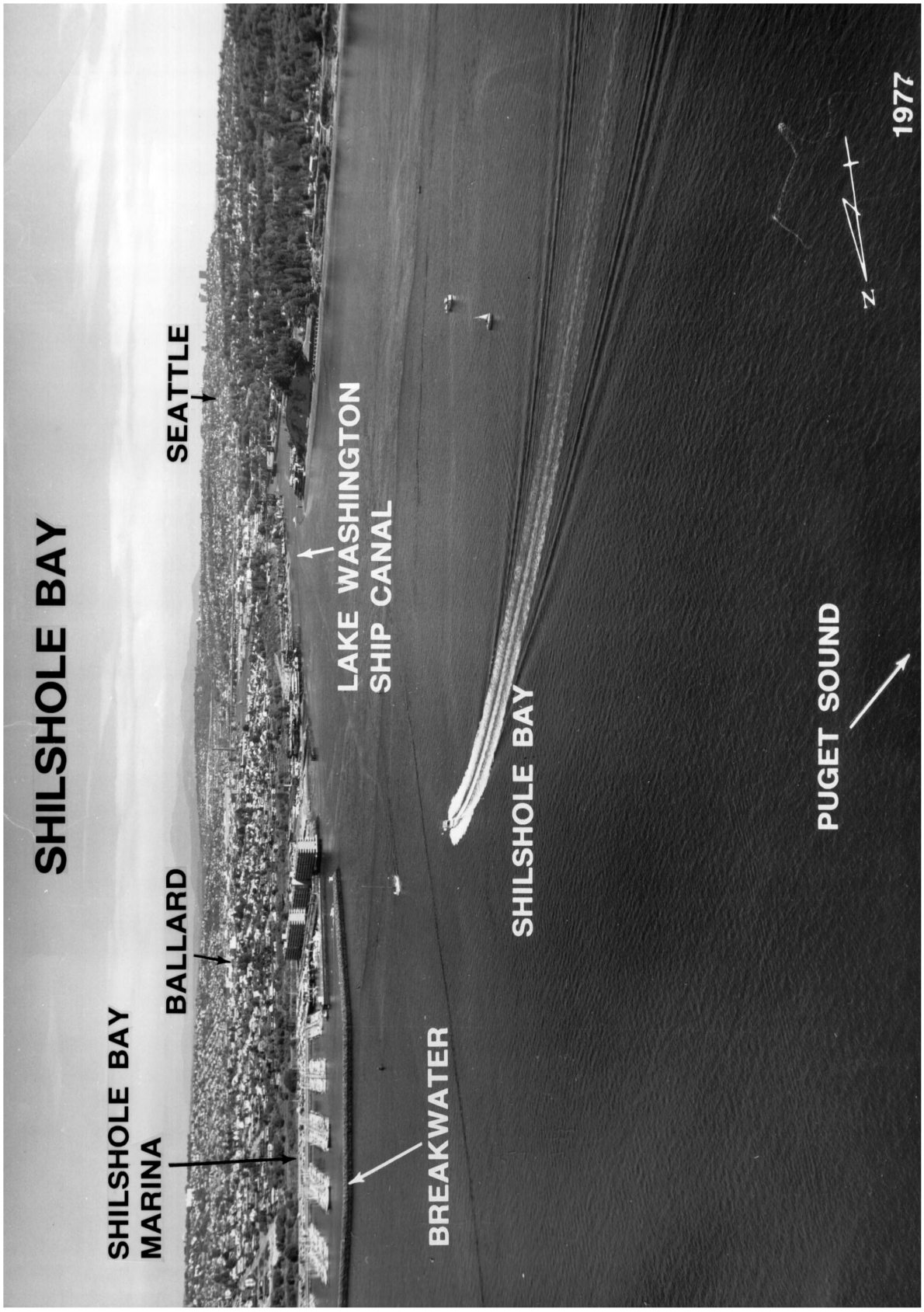
(123) **West Point,** at the N entrance to Elliott Bay, is a low, sandy point which rises abruptly to an elevation of over 300 feet 0.5 mile from its tip. The edge of the shoal extending WSW from the point is marked by a lighted buoy. **West Point Light** (47°39'43"N., 122°26'09"W.), 27 feet above the water, is shown from a 23-foot white octagonal tower attached to a building on the end of the point; a fog signal is at the station. Prominent in the area are the sump tanks of a sewage treatment plant about 0.1 mile E of the light, a VTS antenna tower between the plant and the light, and a large white dome about 1 mile ESE of the light.

(124) **Alki Point,** at the S entrance to Elliott Bay, is low with a small prominent wooded knoll about 80 feet high immediately back of it. E of the knoll, lowland extends for nearly 0.4 mile before rising to the high land extending S from Duwamish Head. **Alki Point Light** (47°34'35"N., 122°25'14"W.), 39 feet above the water, is shown from a 37-foot white octagonal tower attached to a building on the end of the point. A fog signal is at the light.

(125) **Elliott Bay** indents the E shore of Puget Sound just N of Duwamish Head. The entrance is between West Point on the N and Alki Point 5 miles S. The bay proper, lying E of a line between Magnolia Bluff and Duwamish Head, has a width of about 2 miles and extends SE for nearly the same distance. The bay is deep throughout most of its area.

(126) **Magnolia Bluff,** largely bare, light-colored, and rising in places to nearly 300 feet, extends along the N shore from West Point to Smith Cove. **Fourmile Rock** is 60 yards offshore, 1.7 miles SSE of West Point Light. A light is on the rock.

(127) A marina is located just W of **Smith Cove** (Pier 91) below Magnolia Bluff. A 2,700-foot breakwater, marked by private lights at each end, protects the basin on its S side. The basin has entrances on the E and W ends. In 1998, the controlling depth in the basin was reported to be 15 feet.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SHILSHOLE BAY MARINA
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LAKE WASHINGTON SHIP CANAL
BREAKWATER
SHILSHOLE BAY
PUGET SOUND
N
1977

(128) There are berths at the concrete floats for 1,200 craft up to 200 feet long, including transient berthing with larger vessel moorage at the E pier. Electricity, gasoline, diesel fuel, water, laundry, groceries, restaurants, marine supplies and a pump-out station are available. VHF Channel 78A is monitored and a heliport is located at the center of the breakwater. No commercial vessels, commercial work or major boat repairs are allowed.

(129) **Duwamish Head,** 1.8 miles NE of Alki Point and rising to over 260 feet from the point, bounds Elliott Bay to the S. The bluff is tree covered, but is interspersed with houses. The lights of the houses along the beach and on the bluff are conspicuous at night. A shoal, extending over 0.2 mile N of the point, is marked by a light and fog signal.

Chart 18450

(130) **Seattle**, the largest and most important city in the Northwest and one of the major ports of the Pacific Coast, extends as a densely populated greater metropolitan area from Everett, the city to its N, almost to Tacoma, the major city to the S, and E beyond the limits of Lake Washington and its shores. Seattle has many modern, fully equipped ocean terminals, excellent transportation facilities, several large shipyards, and numerous large marine supply houses.

(131) Much of Seattle's shipping is in the Pacific Rim trade, and the city is a major industrial center. Seattle handles most of the waterborne commerce to Alaska Ports, and is the terminus of several shipping lines operating to Alaska as well as other parts of the world. Almost 22 per cent of Seattle's commerce is in the foreign trade, with British Columbia, Japan, Asia, and Europe forming the cornerstone of the overseas commerce. Principal exports are grain and grain mill products, logs, petroleum products, food and vegetable products, lumber, waste and scrap, chemicals, cement, wood chips and fuel wood, fabricated metal products, and sulfur. The principal imports are logs, lumber, sand and gravel, iron and steel, petroleum products, newsprint, bananas, cement, canned fish and shellfish, limestone, machinery, pulp and paper, asphalt and tar, radio and TV products, and clay.

(132) The **Port of Seattle** includes an outer and inner harbor. The outer saltwater harbor includes Elliott Bay; East, West, and Duwamish Waterways; Shilshole Bay, and the portions of Puget Sound adjacent to Ballard on the N and West Seattle to the S of the entrance of Elliott Bay. Seattle's freshwater inner harbor consists of Lakes Union and Washington, which are connected with each other and with Puget Sound by the Lake Washington Ship Canal. Most of the waterfront facilities of the inner harbor are privately owned.

(133) Of the nearly 60 piers and terminals in the outer harbor, the Port of Seattle owns more than 25, operating three and leasing out the others. These properties include 10 general cargo handling facilities and 1 major container handling terminal. The port also has four fully developed marine terminals, and a fifth in the construction phase, on the Duwamish Waterway S of Harbor Island in the Lower Duwamish Development District, a project which provides lease-sites for terminal facilities and water-oriented industries. The Port of Seattle also operates Seattle-Tacoma International Airport, which is located about midway between Seattle and Tacoma.

(134) Although there are several deep-draft terminals on Elliott Bay, many of the piers and wharves are used by fisheries, ferry and tour boat operators and for entertainment facilities.

(135) **East Waterway** is separated from West Waterway by **Harbor Island.** Several important terminals are on the waterway. Most of the N side of Harbor Island is occupied by the piers and drydocks of a shipyard. A private light, shown from the NE corner of Terminal 18, marks the W side of the entrance to East Waterway.

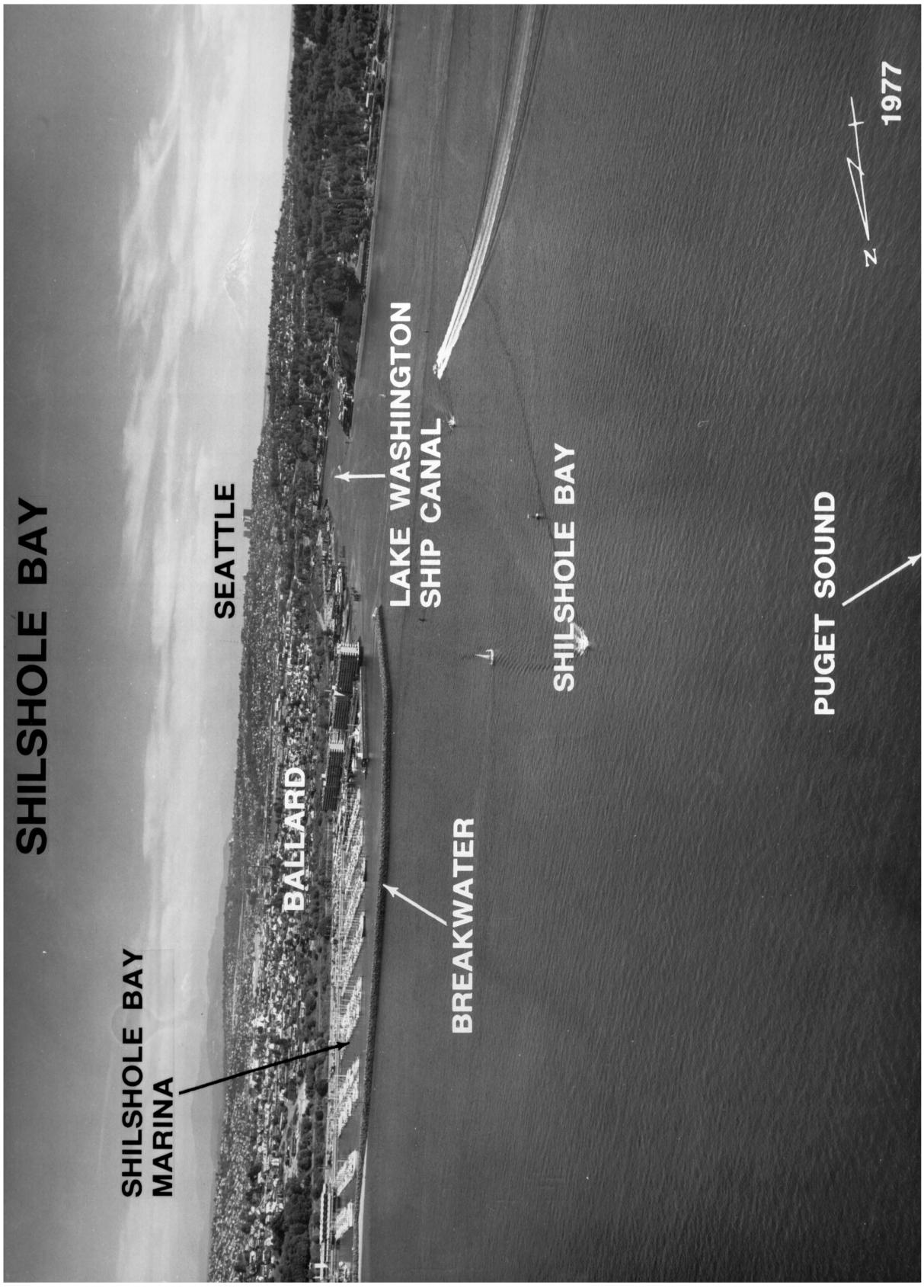
(136) **Note:** Vessels are cautioned against anchoring in the vicinity of pipeline and cable areas shown on the charts.

(137) Most of the E side of **West Waterway** and the area W of the entrance are occupied by the facilities of two large shipyards. The SW side of the waterway is the site of the Port of Seattle's Terminal 5, which receives considerable deep-draft traffic. Several other wharves on the waterway also receive deep-draft vessels. (See **207.750,** chapter 2, for regulations, concerning for the waterway.)

(138) **Duwamish Waterway,** extending S from West Waterway, is fronted by factories and industrial plants for more than 4 miles. A number of log rafts are often anchored along the waterway around Kellogg Island and S of the 1st Avenue South Bridge.

Prominent features

(139) In clear weather the skyline of Seattle itself is unmistakable. From N to S the conspicuous features are: the "Space Needle," a legacy from the 1962 World Fair; the red lighted "E" sign at pier 67; the Washington Building, of light sandstone, usually illuminated at night; the Columbia Center building, distinguishable from other skyscrapers by its greater height; the Seattle Tower; and the square-topped Seattle First National Bank building, distinguished from two other skyscrapers by its slightly taller height and black color.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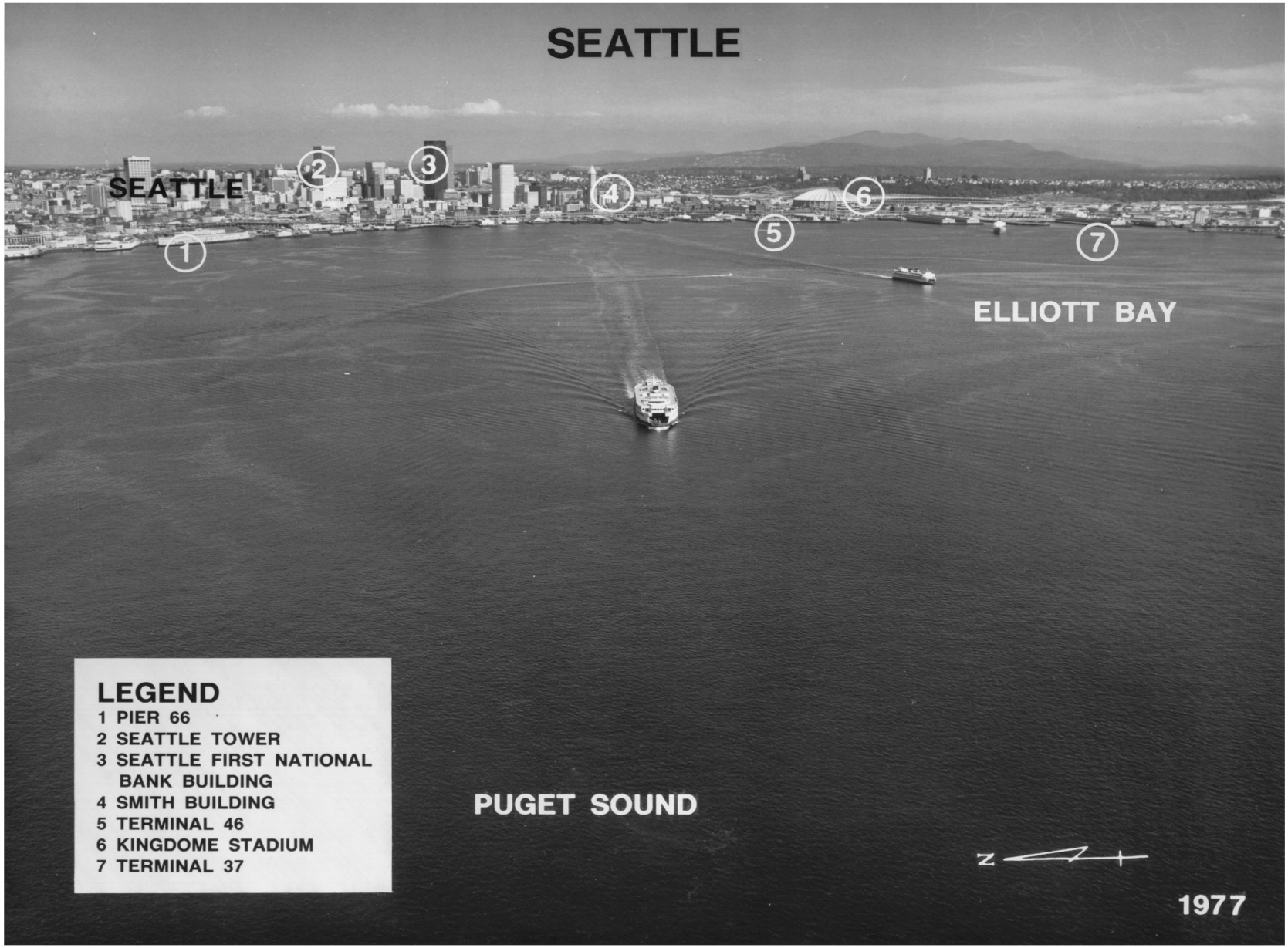
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6 KINGDOME STADIUM
7 TERMINAL 37
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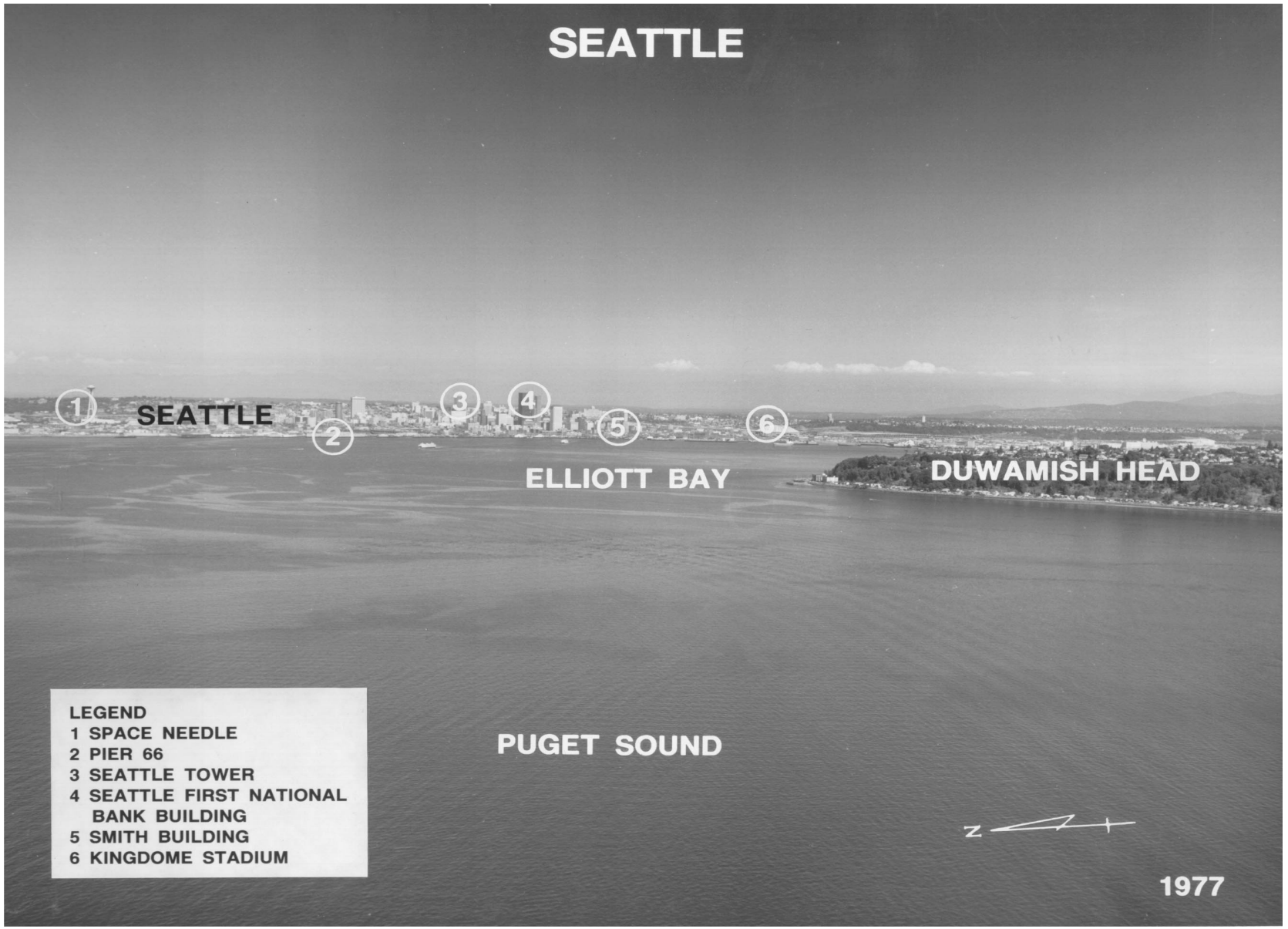
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3 SEATTLE TOWER
4 SEATTLE FIRST NATIONAL BANK BUILDING
5 SMITH BUILDING
6 KINGDOME STADIUM
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Channels

(140) Depths of 34 feet or more are available to the Seattle waterfront in Elliott Bay. A Federal project provides for a depth of 34 feet in East and West Waterways. The project for Duwamish Waterway provides for a 30-foot channel from the S end of West Waterway to the 1st Avenue South Bridge, thence 20 feet for about 0.65 mile to 8th Avenue South, thence 15 feet to a point about 1.2 miles S of the 14th Avenue South Bridge, the end of the project. (See Notice to Mariners and latest editions of charts for controlling depths.)

Anchorages

(141) Four general anchorages are in Elliott Bay. (See **110.1 and 110.230,** chapter 2, for limits and regulations.)

Bridges

(142) There are no bridges over the Seattle waterfront in Elliott Bay, and none over East and West Waterways. The 4.5-mile-long Duwamish Waterway is crossed at Mile 0.2 by the SW Spokane Street swing bridge, with a clearance of 44 feet (55 feet at center); thence a fixed bridge with a clearance of 140 feet just above the swing bridge; thence at Mile 0.3, the Burlington Northern Railroad bascule bridge with a clearance of 7 feet; thence at Mile 2.1, the lst Avenue S dual bascule bridges with a clearance of 22 feet (32 feet at the central 100 feet); thence at Mile 3.3, the 16th Avenue S bascule bridge with a clearance of 21 feet (34 feet at center.) (See **117.1 through 117.59 and 117.1041,** chapter 2, for drawbridge regulations.) The power cables in the waterway have a least clearance of 90 feet (at Mile 3.5.)

Tides and currents

(143) Tides at Seattle have a mean range of 7.7 feet and a diurnal range of 11.4 feet. A range of about 18 feet may occur at the time of maximum tides. (See Tide Tables for daily predictions.) As a rule, the tidal **currents** in the harbor have little velocity. At times, however, with a falling tide an appreciable current will be found setting NW along the waterfront. (See Tidal Current Charts for Puget Sound, Northern Part.)

Weather, Seattle and vicinity

(144) Seattle is on a hilly stretch of land overlooking the salt-waters of Puget Sound to the W, and in an E direction, the waters of Lake Washington, an 18-mile-long (33 km) freshwater lake. The Lake Washington shoreline roughly parallels that of Puget Sound at distances varying from about 2.5 to 6 miles (5 to 11 km). Hills rise rather abruptly from both shorelines and reach elevations of more than 300 feet (92 m) in the central sections and more than 500 feet (153 m) in the extreme Northern and the Southwestern sections. The general N-S trend of the city is paralleled on the E by the Cascade Mountains, while to the W and NW, at somewhat greater distance, the Olympic Mountains rise abruptly. The main commercial section of the city is along the E shore of Elliott Bay, an indentation in the Puget Sound shoreline.

(145) The climate is mild and moderately moist due to the prevailing W air currents, which advance inland from the Pacific Ocean, and to the shielding effects of the Cascade Mountains, which serve to exclude and deflect the cold continental air toward the E. Although the city is 90 miles distant from the ocean at the nearest point, the marine air penetrates readily inland, an effect that is aided by the extensive water surface of Puget Sound. The prevailing W air currents cross vast reaches of ocean, acquiring much water vapor and a temperature near that of the sea. This effect is received from the general currents of the ocean rather than from the Japanese Current which curves far N into Alaskan waters. As a result of the rather steady influx of marine air, winters are comparatively warm and summers cool. Extremes of heat or cold are moderate and usually of short duration, and the daily range in temperature small.

(146) The warmest summer and the coldest winter days come with N to E winds which have traveled under land influences from British Columbia or eastern Washington. In the summer, the number of days having maximum temperatures of 90°F (32.2°C) or above averages less than three but these extreme temperatures have occurred in each month between May and September. Only once during the entire period of record has the temperature reached 100°F (37.8°C, July 1994). The average annual temperature is 52°F (11.1°C) with an average maximum of 59°F (15°C) and an average minimum of 44°F (6.7°C). Nighttime temperatures during the warmest months usually reach comfortable levels, and very seldom remain about 65°F (18.3°C). During the winter, daily maximum temperatures fail to rise above the freezing point (0°C) on an average of only about two days per year, while the number of days having minimum temperatures of 32°F (0°C) or below averages only 15 per year. However, each month, October through May, has recorded sub-freezing temperatures and single-digit temperatures have been recorded in each month from November through February. An extreme low temperature of 0°F (-17.8°C) was recorded in January 1950. In general, temperatures may vary by several degrees at any one time throughout the city, depending on wind direction, distance from shoreline, and elevation.

(147) The normal precipitation of 38 inches (965 mm) is moderate compared with many points along the north

Pacific Coast. Primarily this is due to the location of the city, which lies in the lee or dry side of the Olympic Mountains. The W or windward slopes of these mountains cause the moist marine winds to rise to cooler levels with heavy precipitation on the seaward slopes and diminished amounts E of the summits. A winter seasonal wet period along the Pacific Coast coincides with and is caused by the Aleutian Low. In summer this low pressure recedes N with higher pressures off the coast and results eventually in clear weather, rising temperatures, and decreased humidities. The area has, therefore, a pronounced but not sharply defined wet season extending usually from October through April, a period in which about 82 percent of the total precipitation occurs, and a dry season, May through September, with 18 percent. Excessive precipitation is rare and the 24-hour extreme precipitation event is only 3.41 inches (86.6 mm), but in the wet season the continuance of light or moderate amounts is rather persistent. The average winter snowfall totals about 12 inches (305 mm), and snow seldom remains on the ground for more than 1 or 2 days at a time. Maximum recorded snow depths have ranged from as little as a trace in several instances to over 21 inches (533 mm). The occurrence of light fog is most frequent during late fall and winter where, on average, 19 days report fog during the October through January period. Thunderstorms average about eight per year, lightning damage is very infrequent, and tornadoes have never been reported in the city.

(148) The National Weather Service maintains an office in Seattle. **Barometers** may be compared there or by telephone. (See appendix for address.)

(149) (See page T–8 for **Seattle climatological table.)**

Routes

(150) Vessels bound for the Strait of Georgia from Seattle can use the following routes: **via Rosario Strait–**an approximate midchannel course using the vessel traffic system outbound lane (see the beginning of chapter 12 for Traffic Separation Scheme information), through Puget Sound and Admiralty Inlet to the precautionary area N of Point Wilson, thence E of Partridge Bank, Smith Island, and Davidson Rock to the precautionary area at the S end of Rosario Strait, thence N passing E of Belle Rock, Lydia Shoal, and Peapod Rocks, thence leaving the vessel traffic system lanes at the precautionary area just N of Clark Island, and proceeding into the Strait of Georgia either N or S of Alden Bank; **via Haro Strait–**from Admiralty Inlet using the vessel traffic system outbound lane to the precautionary area N of Point Wilson, thence W of Partridge Bank leaving the vessel traffic system lanes at the precautionary area just SE of Hein Bank, thence through Haro Strait and Boundary Pass to the Strait of Georgia.

(151) These routes are available for vessels of any draft. A range should be steered where available to ensure making the courses good.

(152) Between Admiralty Inlet and the entrance to Rosario Strait, the current on the flood has a tendency to set a vessel E toward Whidbey Island; it also sets strongly through Deception Pass and up Rosario Strait. There is a strong W set in this area on the ebb tide. Through Rosario Strait the currents run with considerable velocity. Heavy tide rips and swirls are found off Black Rock, Obstruction Pass, Peapod Rocks, and Lawrence Point.

(153) In crossing from Admiralty Inlet to the entrance of Haro Strait, the tidal currents setting to and from Rosario Strait and San Juan Channel, with estimated velocities of 2 to 3 knots, should be kept in mind. From Henry Island to around Turn Point, heavy tide rips are found on the ebb. Particularly heavy and dangerous tide rips occur on the ebb between East Point and Patos Island and for 2 miles N in the Strait of Georgia. The flood from Rosario Strait, which is felt as soon as the passage between Orcas and Sucia Islands is open, is apt to set a vessel toward East Point. The ebb in this vicinity sets to the E even before the Strait of Georgia is well open.

Pilotage, Seattle

(154) Pilotage is compulsory for all vessels except those under enrollment or engaged exclusively in the coasting trade on the W coast of the continental United States (including Alaska) and/or British Columbia. Pilotage for Puget Sound is provided by the Puget Sound Pilots. (See Pilotage, Strait of Juan de Fuca and Puget Sound, indexed as such, chapter 12, for detail.)

Towage

(155) Tugs up to 5,000 hp are available in Seattle. Arrangements should be made in advance through ship's agent.

(156) Seattle is a **customs port of entry.**

Quarantine, customs, immigration, and agricultural quarantine

(157) (See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

(158) **Quarantine** is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.) The quarantine anchorage is just N of Harbor Island.

Coast Guard

(159) A **marine safety office** and a **vessel documentation office** are at Pier 36. (See appendix for addresses.)

(160) Harbor regulations

(161) Harbor regulations are enforced by the Harbor Patrol Unit of the Seattle Police Department. The unit has two patrol boats to aid in the enforcement of the city ordinance prohibiting unlawful destruction by excessive speeds, disorderly behavior, or unsafe seamanship. They maintain constant radio contact with each other and the police "land cruisers" on 24-hour patrol. The police patrol all waters of the harbor.

Wharves

(162) The Port of Seattle has numerous piers and wharves on both the outer harbor, including Elliott Bay, East, West, and Duwamish Waterways, and the inner harbor, including the Lake Washington Ship Canal, Lake Union, and Lake Washington. Most of the facilities in the inner harbor are privately owned and handle barge traffic almost exclusively. Only the deep-draft facilities are described. For a complete description of the port facilities refer to Port Series No. 36, published and sold by the U.S. Army Corps of Engineers. (See appendix for address.) The alongside depths are reported. (For information on the latest depths contact the Port of Seattle general office or the private operators.) All facilities described have direct highway connections, and most have plant trackage with direct railroad connections. Water is available at most of the wharves, but electrical shore power connections are available at less than half of the wharves. General cargo at the port is usually handled by ships' tackle. Special handling equipment, if available, is mentioned in the description of the particular facility. Shore-based hoisting equipment with capacities up to 200 tons and floating cranes with capacities to 400 tons are available to the public at Port of Seattle.

(163) Of the facilities described, nearly two-thirds are owned by the Port of Seattle and leased to private operators. The port owns seven large general cargo facilities, including six which also handle containerized cargo, a grain elevator, and a large terminal for handling foreign automobiles.

(164) In recent years, the bulk of Seattle's marine commerce has shifted from the Elliott Bay waterfront to the large marine terminals on East and West Waterways and to the newly developed terminals along both sides of the Duwamish Waterway S of Harbor Island. Many of the former general cargo piers on Elliott Bay no longer receive commercial shipping, operating now as shops, restaurants, stores, or simply as storage facilities.

Facilities on Elliott Bay:

(165) **Port of Seattle, Terminal 91, Pier 91** (47°37'35"N., 122°22'58"W.): W side, 2,495-foot berthing space; E side, 1,875-foot berthing space; 357-foot face; 35 feet alongside; deck height, 18 feet.

(166) **Port of Seattle, Terminal 91, Pier 90** (47°37'35"N., 122°22'48"W.): W side, 1,875-foot berthing space; E side, 2,222-foot berthing space; 295-foot face; 35 feet alongside; deck height, 18 feet.

(167) The terminal has 60,000 square feet of open storage; pipelines extend to storage tanks with 198,000-barrel capacity; 4.5 million cubic feet of cold storage; receipt of automobiles and seafood; receipt and shipment of fruit and petroleum products; occasional receipt and shipment of conventional general cargo and roll-on/roll-off general cargo; mooring and bunkering vessels; owned by Port of Seattle; and various operators.

(168) **Louis Dreyfus Corp., Terminal 86, Grain Wharf** (47°37'24"N., 122°22'12"W.): 1,400-foot berthing space with dolphins; 434-foot face; 70 feet alongside; deck height, 20 feet; 4.2-million bushel grain elevator, loading rate of 100,000 bushels per hour; railroad trackage for up to 220 rail cars; owned by Port of Seattle; and operated by Louis Dreyfus Corp.

(169) **Washington State Ferries, Colman Ferry Terminal, Pier 52** (47°36'09"N., 122°20'22"W.): terminus of the ferry routes between Seattle and Winslow and Seattle and Bremerton. There are three ferry slips here with ferries operating 24 hours a day (For information on routes or schedules, contact Washington State Ferries, Seattle Ferry Terminal, Seattle, WA, telephone (206-464-6400) or by Port of Seattle, Pier 48 (47°36'00"N., 122°20'23"W.): deck heights, 16 and 19 feet; N and S sides, 520-foot berthing space; 35 feet alongside; 250-foot face; mooring vessels; owned and operated by Port of Total Terminals, Terminal 46 Wharf (47°35'48"N., 122°20'28"W.): 1,874 feet of berthing space; deck height, 18.5 feet; 50 feet alongside; 70 acres of open storage; six traveling gantry cranes to 40 tons; receipt and shipment of containerized cargo in foreign and domestic trade; owned by Port of SSA Terminals, Terminal 37 Wharf (47°35'32"N., 122°20'33"W.): 850 feet of berthing space; 29 to 40 feet alongside; deck heights, 18.5 and 21 feet; 12 acres of open storage; lifts to 15-tons; receipt and shipment of conventional general cargo, heavy lift items, and steel products in foreign and domestic trade; owned by Port of Seattle; and operated by SSA Terminals, Inc.

(170) **U.S. Coast Guard, Pier 36 Slip** (47°35'24"N., 122°20'31"W.): N side, 1,050 feet of berthing space, 35 feet alongside; deck height, 21 feet; mooring U.S. Coast Guard vessels; owned by the U.S. Government; and operated by the U.S. Coast Guard.

(171) **Rainier Petroleum Corp. and Equilon Enterprises, Pier 15** (47°35'20"N., 122°21'12"W.): 460 feet of berthing space on E and W side of pier; 35 to 40 feet alongside; deck height, 19 feet; pipelines extend to storage tanks with 550,000-barrel capacity; receipt and

shipment of petroleum products; bunkering vessels; owned by ExxonMobil Corp.; and operated by Rainier Petroleum Corp. and Equilon Enterprises, LLC.

(172) **Crowley Marine Services, Alaska Hydro-Train Car-Float Transfer Bridge, Terminal 2** (47°35'01"N., 122°22'15"W.): 40 feet alongside; 400 by 100 feet of berthing space; two-track transfer bridge on pontoons; owned by Port of Seattle; and operated by Crowley Marine Services, Inc.

Facilities on East Waterway:

(173) **Note:** Vessels are cautioned against anchoring in vicinity of pipeline and cable areas shown on the charts.

(174) **SSA Terminals, Terminal 18, Berths 2 to 6** (47°34'11"N., 122°20'45"W.): 5,000 feet of berthing space; 40 to 50 feet alongside; deck height, 17 feet; traveling cranes to 50 tons; 196 acres open storage; pipelines extend to storage tanks with 850,000-barrel capacity; receipt and shipment of containerized general cargo in foreign and domestic trade; receipt and shipment of petroleum products; loading barges for bunkering vessels at berth; owned by Port of Seattle; and operated by SSA Terminals and Kinder Morgan Energy Partners LP.

(175) **SSA Terminals, Terminal 18, Berth 7** (47°34'34"N., 122°20'45"W.): 1,216 feet of berthing space; 36 to 40 feet alongside; deck height, 17 feet; traveling crane to 50 tons; pipeline extends to storage tanks with 4-million gallon capacity; receipt and shipment of conventional general cargo and heavy-lift items in foreign and domestic trade; and receipt of molasses; owned by Port of Seattle; and operated by SSA Terminals and PM Ag Products, Inc.

(176) **Trans Pacific Container Service Corp., Terminal 30 Wharf** (47°34'49"N., 122°20'35"W.): 1,812 feet of berthing space; 40 to 44 feet alongside; deck height, 18.5 feet; 45 acres of open storage; three 50-ton container cranes; receipt and shipment of containerized general cargo in foreign and domestic trade; owned by Port of Seattle; and operated by Trans Pacific Container Service Corp.

(177) **SSA Terminals, Terminal 25 Wharf** (47°34'32"N., 122°20'35"W.): 1,580 feet of berthing space; 50 feet alongside; deck height, 18.5 feet; 37 acres open storage; three 40-ton container cranes; receipt and shipment of containerized general cargo in domestic trade; owned by Port of Seattle; and operated by SSA Terminals.

(178) **BP Oil Co., Seattle Terminal, Pier No.11** (47°34'57"N., 122°21'30"W.): 460 feet of berthing space with dolphins; 32 feet alongside; deck height, 20 feet; pipelines extend to storage tanks with 617,800-barrel capacity; receipt and shipment of petroleum products; bunkering vessels; and loading barges for bunkering vessels at berth; owned and operated by BP Oil Co.

(179) **Pendleton Flour Mills Wharf** (47°34'31"N., 122°21'30"W.): this wharf was reported not in use in 2002. Note: Strong currents exist on ebb tide and during freshet at this wharf; a countercurrent of eddy exists at the N end of the W berth. A cable area and pipeline extend across the Duwamish River from the S end of the S berth.

(180) **American President Lines, Terminal 5 Wharf** (47°34'37"N., 122°21'41"W.): 2,900 feet of berthing space; 45 to 50 feet alongside; deck height, 19 feet; five 50-ton container cranes; 130 acres of open storage; receipt and shipment of containerized cargo in foreign and domestic trade; owned by Port of Seattle; and operated by American President Lines.

(181) **Pacific Terminals, West Wharf** (47°34'26"N., 122°21'38"W.): 220 feet of berthing space; 15 feet alongside; deck height, 19 feet; receipt and occasional shipment of lumber; receipt of wood pulp and paper products; owned by Puget Sound Freight Lines; and operated by Pacific Terminals, Ltd.

(182) **Pacific Terminals, East Wharf** (47°34'26"N., 122°21'32"W.): 450 feet of berthing space; 15 feet alongside; deck height, 19 feet; receipt and occasional shipment of lumber; receipt of wood pulp and paper products; owned by Puget Sound Freight Lines; and operated by Pacific Terminals, Ltd. Note: Two tugs are recommended when docking at East West Waterway Co. Wharf (47°34'24"N., 122°21'26"W.): 45-foot face; 160 feet of berthing space; 35 feet alongside; deck height, 19 feet; 40-ton gantry crane; 2 acres of open storage; mooring vessels; owned by Chester W. Whitman; and operated by West Waterway Co.

Facilities on the Duwamish Waterway:

(183) **Ash Grove Cement Co., North Wharf** (47°34'06"N., 122°20'44"W.): 600 feet of berthing space; 25 feet alongside; deck height, 20 feet; pneumatic pipelines with loading rate of 350 tons per hour; cement storage silos with 54,500-ton capacity; occasional shipment of bulk cement; owned and operated by Ash Grove Cement Co.

(184) **Ash Grove Cement Co., South Pier** (47°34'03"N., 122°20'45"W.): 360 feet of berthing space; 25 feet alongside; deck height, 20 feet; 35-ton derrick; front-end loader with rate of 600 tons per hour; open storage for 33,000 tons of lime rock, 15,000 tons of gravel, 8,000 tons of coal and a silo for 4,500 tons of gypsum; owned and operated by Ash Grove Cement Co.

(185) **Birmingham Steel Corp., Terminal 105, Berth No.1 Wharf** (47°33'54"N., 122°20'56"W.): 660 feet of berthing space; 40 feet alongside; deck height, 17 feet; diesel crawler crane to 100 tons; 3.7 acres of open storage; receipt of scrap metal by barge; owned by Port of Seattle; and operated by Birmingham Steel Corp.

(186) **Lafarge Corp., Seattle Plant, Cement Wharf** (47°33'19"N., 122°20'42"W.): 645 feet of berthing space; 32 feet alongside; deck height, 25 feet; pipelines extend to storage silos with 68,250-ton capacity; receipt and shipment of bulk cement by barge; owned and operated by Lafarge Corp.

(187) **Lafarge Corp., Seattle Plant, Raw Materials Wharf** (47°33'14"N., 122°20'35"W.): 1,100 feet of berthing space; 30 feet alongside; deck height, 20 feet; one traveling hammerhead crane with unloading rate of 1,000 tons per hour; open storage for 50,000 tons of bulk material; receipt of limestone, shale, coal, and slag; owned and operated by Lafarge Corp.

(188) **Glacier Northwest, West Terminal Wharf** (47°32'56"N., 122°20'25"W.): 467 feet of berthing space; 34 to 40 feet alongside; deck height, 20 feet; traveling cement unloader with unloading rate of 400 tons per hour; pipelines extend to storage silos with 50,000-ton capacity; receipt of bulk cement by vessel and barge; owned and operated by Glacier Northwest.

(189) **Glacier Northwest, Slip No. 2 Wharf** (47°32'49"N., 122°20'16"W.): 325 feet of berthing space; 16 to 17 feet alongside; deck height, 15 feet; conveyor belt system with 400-ton unloading rate; storage area with 13,000-ton capacity; receipt of sand and gravel by barge; owned and operated by Glacier Northwest.

(190) **International Terminal Co., Terminal 115, North Wharf** (47°32'54"N., 122°20'24"W.): 925 feet of berthing space; 40 feet alongside; deck height, 20 feet; one 50-ton gantry crane; twenty-five forklift trucks with 23-ton capacity; 6.4 acres of open storage; receipt and shipment of conventional general cargo and heavy-lift items in foreign and domestic trade; receipt of steel products; receipt and shipment of forest products; owned by Port of Seattle; and various operators.

(191) **Northland Services, 8th Avenue Terminal Wharf** (47°32'05"N., 122°19'16"W.): 1,035 feet of berthing space; 13 to 15 feet alongside; deck height, 18 feet; cranes to 150 tons; 20 acres open storage; receipt and shipment of conventional and containerized general cargo in domestic trade (Alaska); owned by Crowley Marine Services; and operated by Northland Services, Inc.

Supplies

(192) Marine supplies of all kinds are available in Seattle. Bunker fuel, diesel oil, and lubricants are available. Large vessels can be bunkered at Pier 91, Pier 15 (Rainer Petroleum Corp. and Equilon Enterprises) and at Pier 11 (BP Oil Co.). Bunkering may be done at other berths by tank barges. Water is available at most berths. N of Seattle, vessels may bunker at Point Wells or Edwards Point.

Repairs

(193) There are two large shipyards in the Seattle area, both on Harbor Island at the S end of Elliott Bay. The largest floating drydock, at a shipyard just E of the entrance to West Waterway, has a capacity of 40,000 tons, an overall length of 873 feet, a minimum clear inside width of 137 feet and a depth over the keel blocks of 30 feet. Gantry cranes to 150-ton capacity are available at the yard. Another shipyard, at the NW end of Harbor Island, has a drydock which is only slightly smaller. Smaller shipyards are on the Duwamish River and on Lake Union, in the inner harbor. There are larger drydocks at the Puget Sound Naval Shipyard in Bremerton, available for private use under certain conditions when not required by the Government.

Small-craft facilities

(194) In addition to the large Shilshole Bay Marina, mentioned earlier in this chapter, numerous small-craft facilities line the shores of Lake Union, Lake Washington, Lake Washington Ship Canal, Elliott Bay, and Duwamish Waterway. (See the small-craft facilities tabulation on charts 18445 and 18447 for services and supplies available.)

Communications

(195) Ferry service for passengers and automobiles is available to many points on Puget Sound. Seattle is served by two important railroads, and by many steamship and towing companies. Many airlines have passenger and freight service to Seattle-Tacoma International Airport. Seattle is the major port for Alaska commerce, by both water and air carriers.

Chart 18447

(196) **Lake Washington Ship Canal** extends from Puget Sound through Shilshole Bay, Salmon Bay, Lake Union, Portage Bay, and Union Bay to deep water in Lake Washington. Federal project depth through the canal is 30 feet, which is generally maintained. (See Notice to Mariners and latest editions of charts for controlling depths.) The entrance to Lake Washington Ship Canal is marked by a lighted range, lights, and buoys.

(197) A **speed limit** of 4 knots is enforced within the guide piers of the Hiram M. Chittenden Locks. A **speed limit** of 7 knots is enforced elsewhere in the Lake Washington Ship Canal, except in an area marked by four private buoys in the N part of Lake Union.

(198) The **Hiram M. Chittenden Locks,** a double lock, and a fixed dam are at the narrows of the entrance to Salmon Bay, 1.2 miles in from the sound. The large lock, a two-chamber structure, has a clear length of

LAKE WASHINGTON SHIP CANAL

760 feet, width of 80 feet, lift of 26 feet, and depth over the lower miter sill of 29 feet. The small lock has a clear length of 123 feet, width of 28 feet, lift of 26 feet, and depth over the lower sill of 16 feet. Passage time is less than 30 minutes for large vessels and 5 to 10 minutes for small vessels.

(199) A saltwater barrier extends across the E end of the E chamber of the large lock to reduce the intrusion of saltwater into Lake Washington and to conserve water. (See **207.750**, chapter 2, for navigation regulations for Lake Washington Ship Canal, the Hiram M. Chittenden Locks, and the saltwater barrier.)

Depths

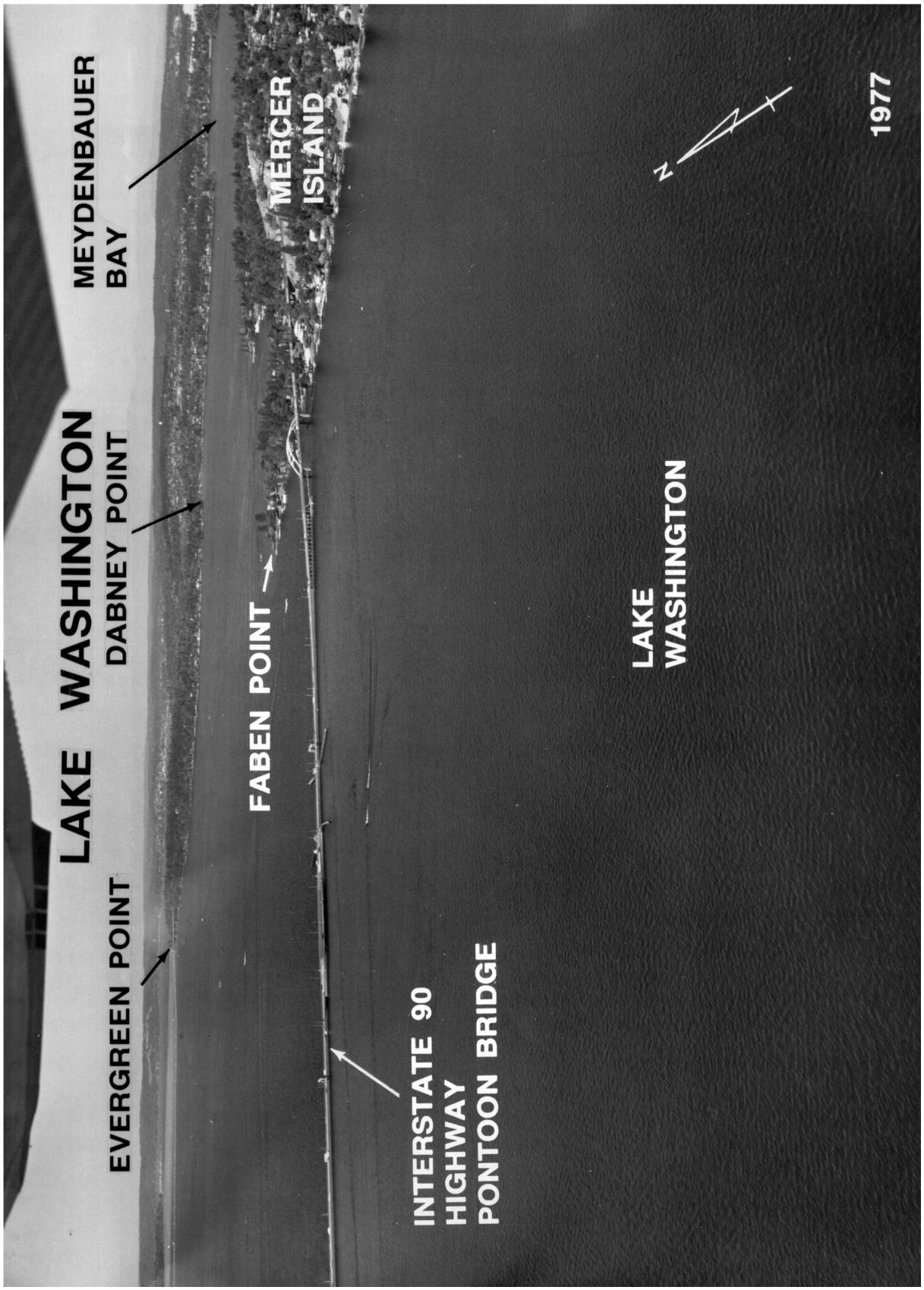
(200) Depths above Hiram M. Chittenden Locks are referred to low water of the lakes which is 20 feet above the plane of mean lower low water of Puget Sound.

Heights

(201) Vertical clearances above Hiram M. Chittenden Locks are referred to the mean water level of the lakes, which is 21 feet above mean lower low water of Puget Sound.

(202) **Salmon Bay** extends for about 0.8 mile from the E end of the locks to the Ballard (15th Avenue) Bridge. There are numerous piers and floats with extensive small-craft facilities on the bay. Fishermen's Terminal, operated by the Port of Seattle, is immediately W of the Ballard Bridge. The terminal is the home port of a large commercial fishing fleet. Depths of 14 to 28 feet are alongside the piers. There are 700 berths for craft 27 to 176 feet long. Complete facilities for fishing boats are available at the 54-acre terminal, including electricity, gasoline, diesel fuel, water, net repair yards, and all types of marine supplies. Marine railways at the terminal can handle craft to 300 tons for complete repairs. A travel lift to 46 feet is also available at the terminal.

(203) From Salmon Bay the canal leads SE to **Lake Union,** which is about 1 mile long in a N-S direction and about 0.5 mile wide. Depths in the lake range generally from 32 to 49 feet. There is a 10-foot shoal about 200 yards offshore from the SW end of the lake; it is marked by a buoy. Four private buoys in the N part of Lake Union mark an unrestricted speed zone, which is used by boat builders around the lake as a testing area. The buoys are frequently repositioned; caution is advised when transiting the area. There are numerous marinas and repair facilities, and several commercial wharves from which various commodities are shipped by barge. The National Oceanic and Atmospheric Administration's **Marine Operations Center, Pacific**, operates two piers on the E side of the lake which serve as the shipbase for the National Ocean Service's Pacific fleet. The N side of the N pier has a 510-foot berth with 20 to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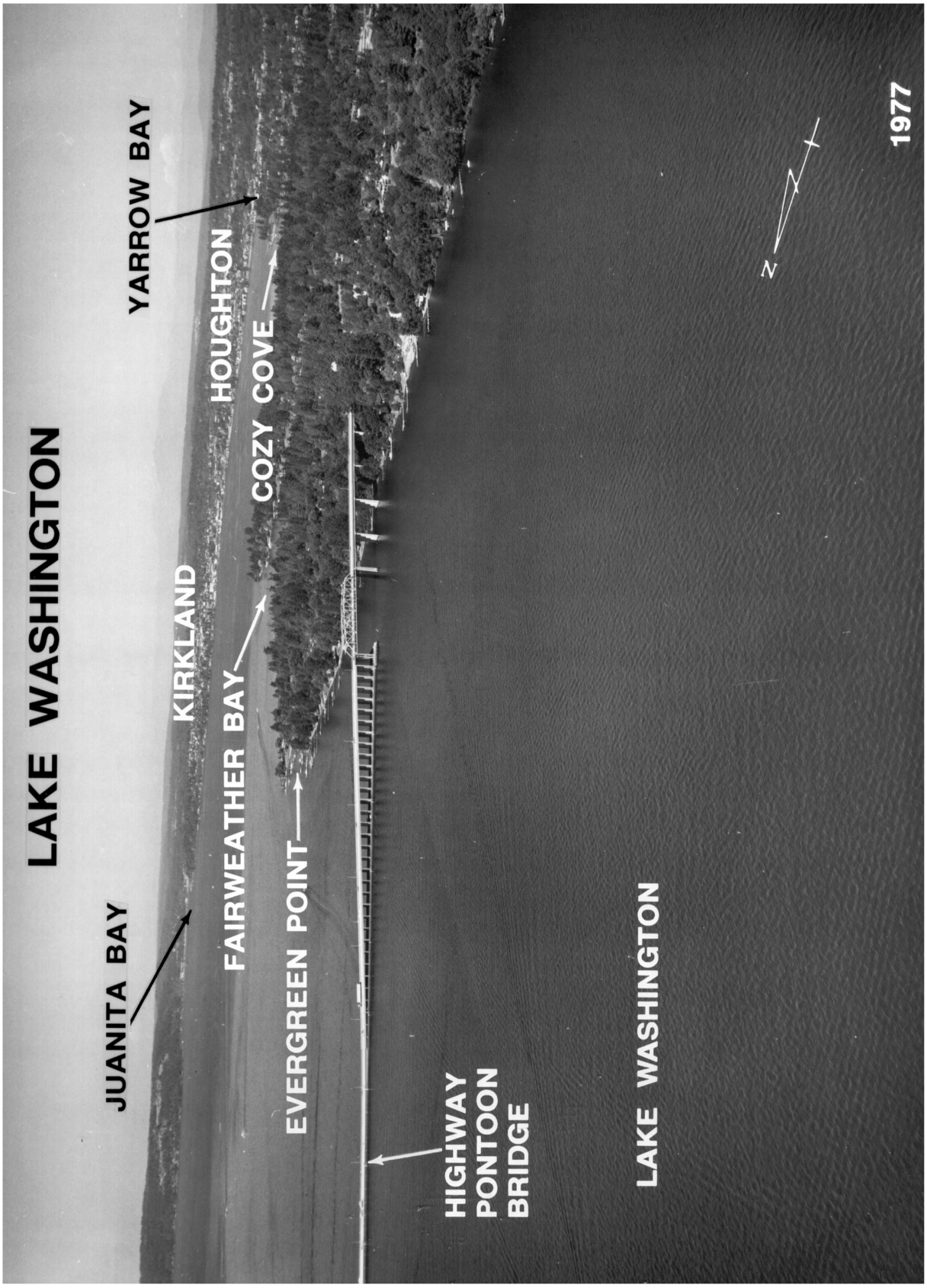
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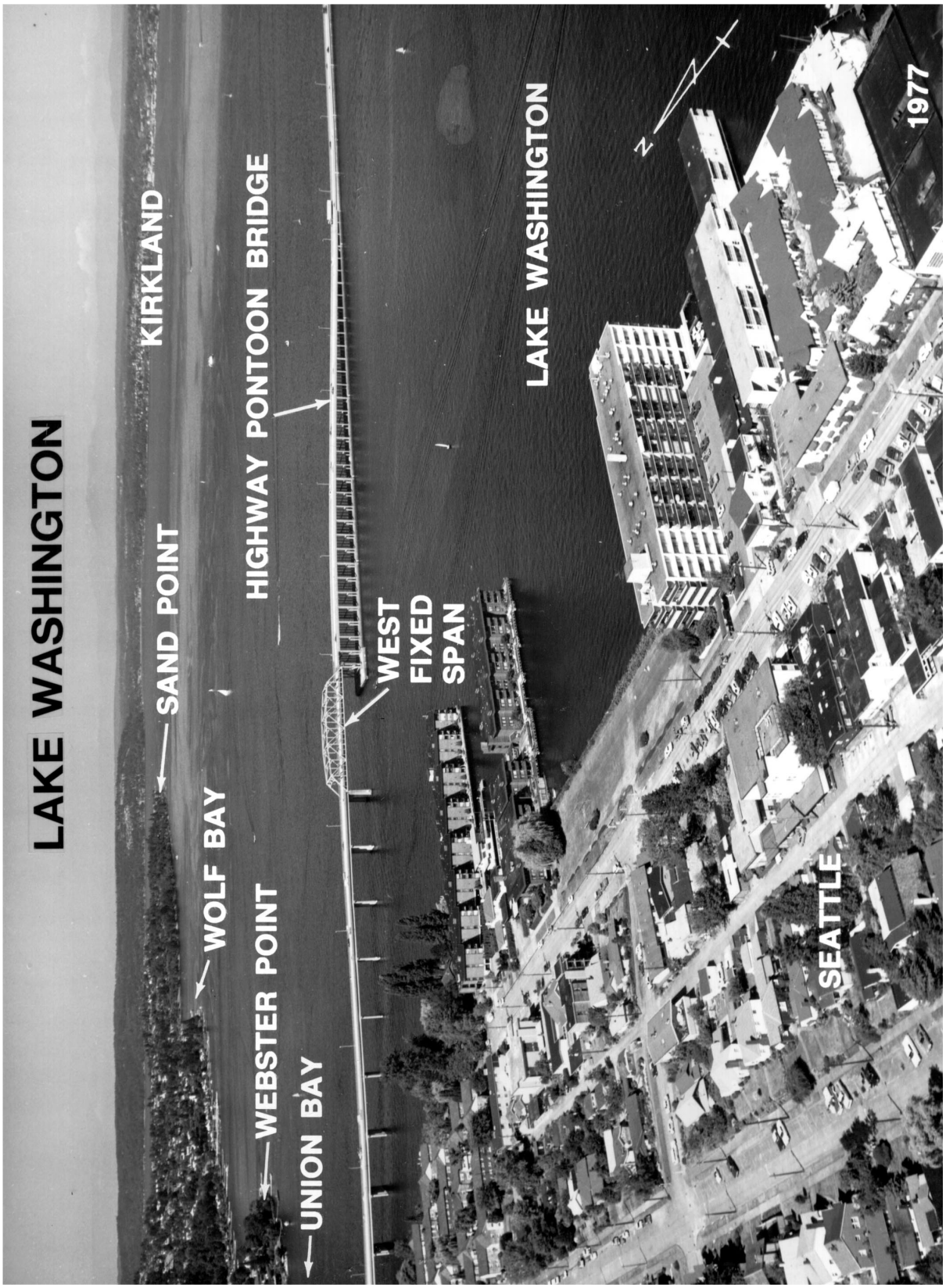
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UNION BAY
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SEATTLE
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44 feet alongside; the S side has a 530-foot berth with 12 to 45 feet alongside. The N side of the S pier has a 335-foot and a 285-foot berth with 26 to 49 feet alongside, and the S side of the pier has a 340-foot and a 290-foot berth with 26 to 49 feet alongside.

(204) A drydock company adjacent to the Marine Operations Center, Pacific, has several floating drydocks, the largest of which has a lifting capacity of 3,600 tons.

(205) **Portage Bay,** E of Lake Union has many slips and finger piers for small craft; gasoline, diesel fuel, and hull and engine repairs are available on the NE shore.

(206) **Montlake Cut (Portage Cut)** leads from Portage Bay past the conspicuous buildings and athletic stadium of **University of Washington,** on the N side, thence into **Union Bay,** and thence into Lake Washington.

(207) Lake Washington Ship Canal is crossed by five bascule bridges and two fixed bridges. Clearances of the drawspans are 14 to 43 feet. (See **117.1 through 117.59 and 117.1051**, chapter 2, for drawbridge regulations.) The bridgetenders of the drawbridges monitor VHF-FM channel 16 and 13, and works on channel 13. The call signs are as follows: Burlington Northern Railroad, KCE-201; Ballard (15th Avenue), KJA-445; Fremont Avenue, KJA-442; University, KJA-441; Montlake, KJA-438. The fixed bridges have a least clearance of 127 feet. Cables crossing the canal have a least clearance of 155 feet.

(208) **Lake Washington,** the large freshwater lake on Seattle's E side, provides deep and protected water over most of its length of nearly 16 miles. Its shores are studded with private piers and landings, and there are marinas and small-craft repair places at many locations.

(209) There are few commercial installations. Except for a few oil wharves, commercial shipments are by barge. A large offshore wharf of a tar and creosote company is at **May Creek (Port Quendall)** on the E side of the lake opposite the S end of Mercer Island. A lumber mill and creosoting plant are here. A large log storage area is at May Creek.

(210) State Route 520 pontoon bridge crossing the lake between Seattle and Evergreen Point has a fixed span at the E and W ends. The clearances are 57 feet at the E end and 44 feet at the W end. The floating drawspans at the center of the bridge provide an opening 100 feet wide. (See **117.1 through 117.59 and 117.1049**, chapter 2, for drawbridge regulations.) Interstate Route 90 pontoon bridge between Seattle and East Seattle, on the N end of **Mercer Island**, has fixed spans at the E and W ends with clearances of 29 feet. The fixed highway (Interstate Route 90) bridge on the E side of Mercer Island, from Barnabie Point to the mainland, has a clearance of 71 feet. The underwater remains of the E and W piers of a former fixed bridge are just SE of the Interstate Route 90 bridge. Mariners should use caution when outside the main navigation channel.

(211) A **091°55'-271°55' measured nautical mile** has been established along the pontoon bridge to Mercer Island. The targets are painted on both sides of the bridge so that the courses can be run either N or S of the bridge.

(212) Combined **measured half nautical mile, nautical mile,** and **2,000-meter measured courses** have been established along the pontoon bridge from Foster Island to Evergreen Point on a bearing of **102°30'-282°30'**. The half nautical mile and nautical mile courses are marked on the S side of the bridge by 18-inch circles resembling an engineers target; the half nautical mile markers have green and white quadrants, and the nautical mile markers have red and white quadrants. The 2,000-meter course is marked by 1- by 3-foot green markers with 3-inch white vertical stripes on both sides of the bridge.

(213) **Houghton,** at the NE side of the lake just S of Kirkland, is the site of a former shipyard. There are several marinas catering to yachtsmen.

(214) **Juanita Bay,** N of Kirkland, is a summer recreational area with several small piers.

(215) The headquarters of the Naval Support Activity Seattle, and storage facilities and offices of the National Oceanic and Atmospheric Administration are at **Sand Point** on the W shore of the lake just NE of Union Bay.

(216) **Kenmore,** at the N end of Lake Washington about 4.4 miles N of Sand Point, is the site of several marinas and a barge loading facility. A dredged channel, marked by lighted buoys, leads across the flats to a turning basin. In March 2001, the controlling depth was 12.4 feet in the dredged channel.

(217) A seaplane base is at Kenmore.

(218) **Sammamish River,** about 0.1 mile S of Kenmore, is entered through a dredged channel that branches NE from the Kenmore channel. In March 2001, the controlling depth was 2.8 feet in the N half with shoaling to bare in the S half. About 0.3 mile above the mouth of the river is a highway bridge with a 47-foot fixed span and a clearance of 12 feet.

Chart 18441

(219) **Possession Sound** joins Puget Sound at the S point of Whidbey Island and extends in a general N direction for 10 miles to its junction with Saratoga Passage and Port Susan. From the entrance it extends for 3.5 miles with an average width of 2 miles, and then expands into an irregular basin about 6 miles in diameter.

(220) The E part of this basin is filled with extensive flats, many of which uncover and rise abruptly from deep water. These flats are intersected by several shifting channels, forming the mouth of the Snohomish River. The waters of the sound are generally deep, and the only anchorage used by large vessels is off the town of Everett, close inshore, in 10 to 15 fathoms.

(221) **Meadowdale,** a residential area on Browns Bay, is on the E side of the sound about 4 miles S of Possession Point. There is a large dry storage boathouse here with a hoist that can handle craft to 24 feet. Several floats are available during the summer months; gasoline and covered storage for about 40 craft are also available. Reported depths of 5 feet can be carried to the hoist on the NW face of the wharf. Norma Beach, about 3 miles S of Possesion Point, is on the E side of the sound. A boathouse with a marine railway that can handle small craft to 20 feet; gasoline and dry storage are available.

Chart 18443

(222) **Elliot Point**, on the E side of Possession Sound 4 miles NE of Possession Point, is a low spit projecting some 200 yards from the high land. **Mukilteo Light** (47°56.9'N., 122°18.3'W.), 33 feet above the water, is shown from a 30-foot white octagonal tower on the point; a fog signal is at the station.

(223) **Mukilteo** is a town E of Elliot Point. An automobile ferry runs between Mukilteo and Clinton on Whidbey Island. A light about 300 yards NE of Mukilteo Light marks the approach to the ferry dock. A wharf for deep-draft vessels is 0.4 mile E of Mukilteo Light.

(224) **Gedney Island,** 3.5 miles N of Elliot Point, is about 1.5 miles long in an SE direction, high, wooded, and prominent. From its SE point, a shoal extends SE, the 5-fathom curve being at a distance of 0.8 mile. Foul ground extends 0.2 mile from the S side of the E half of the island. A buoy is on the N side of the shoal area.

(225) A fish haven, marked by a private buoy, is about 0.5 mile S of Gedney Island in about 47°59'48"N., 122°18'30"W. A marina, protected by a breakwater, is on the NE side of the island. The breakwater is marked by private lights.

(226) **Clinton,** a village on **Randall Point,** is the Whidbey Island terminus of the ferry from Mukilteo. The town has several stores; a restaurant is near the ferry slip. Gasoline is available.

Chart 18444

(227) **Everett**, an important wood products shipping port, is on the E side of **Port Gardner,** 4 miles NE of Elliot Point. A tall pulpmill chimney and the Port of Everett's large alumina silo are prominent along the water.

Channels

(228) Depths of about 22 feet or more are available to the main wharves in Port Gardner. A dredged channel with two settling basins extends inside a training dike along the E side of **Jetty Island** and in the Snohomish River around the N half of the city to a lumbermill 6 miles above Port Gardner. The channel is marked by lights, buoys, and lighted and unlighted ranges. The second settling basin is subject to continual shoaling. (See Notice to Mariners and latest editions of charts for controlling depths.)

Anchorages

(229) The general anchorage area is W of the waterfront. (See **110.1 and 110.230**, chapter 2, for limits and regulations.) Vessels usually proceed to the wharves. A buoy marks a submerged obstruction near the center of the anchorage.

Tides

(230) The mean range of the tide at Everett is about 7.4 feet, and the diurnal range of tide is 11.1 feet.

Pilotage, Everett

(231) Pilotage is compulsory for all vessels except those under enrollment or engaged exclusively in the coasting trade on the W coast of the continental United States (including Alaska) and/or British Columbia. Pilotage for Puget Sound is provided by the Puget Sound Pilots. (See Pilotage, Strait of Juan de Fuca and Puget Sound, indexed as such, chapter 12, for details.)

Towage

(232) Tugs up to 3,000 hp are available at Everett, and larger tugs may be obtained from Seattle. Arrangements should be made in advance through ships' agents.

Quarantine, customs, immigration, and agricultural quarantine

(233) (See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

(234) **Quarantine** is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

(235) Everett is a **customs port of entry.**

Harbor regulations

(236) Harbor regulations are enforced by the manager of the Port of Everett, who serves as **harbormaster** and port warden.

Wharves

(237) The Port of Everett operates three deep-draft piers on Port Gardner. One deep-draft pulpmill wharf is at Everett in addition to the port-owned facilities; wood products, hogged fuel, petroleum products, chemicals, and other commodities by barge are handled. Only the deep-draft facilities are described. For a complete description of the port facilities refer to Port Series No. 37, published and sold by the U.S. Army Corps of Engineers. (See appendix for address.) The alongside depths are reported. (For information on the latest depths, contact port authorities or the private operators.) All the facilities described have both direct highway and railroad connections. Water is available at most of the wharves, but electrical shore power is available only at Hewitt Avenue Terminal Pier 3. General cargo at the port is usually handled by ships' tackle. Special handling equipment, if available, is mentioned in the description of the particular facility.

Port Piers:

(238) Hewitt Avenue Terminal Pier 1 (47°58'45"N., 122°13'20"W.): deck height, 18 feet; N side, 520-foot berthing space, 45 feet alongside; S side, 600-foot berthing space, 30 feet alongside; 93,000 square feet covered storage, 43,000 square feet paved open storage; a 35-ton traveling, multipurpose crane moves the length of the pier, unloading rate for bulk alumina 900 tons per hour; a 55,000-ton capacity alumina silo is fed by a 1,300-foot conveyor system with a loading rate of 1,200 tons per hour; one 5-ton mobile crane, forklifts to 10-ton capacity, two lumber straddle carriers; also used for the receipt and shipment of general cargo, receipt of alumina; owned and operated by the Port of Everett.

(239) Hewitt Avenue Terminal Pier 3: immediately N of Pier 1; 40 feet alongside; deck height, 19 feet; 13 acres open storage; shipment of logs and lumber, shipment of general cargo and machinery to Alaska; owned and operated by the Port of Everett.

(240) **Note:** Although these piers are dredged to depths of up to 45 feet, the controlling depth on the approach to the piers is only 32 feet.

(241) Norton Terminal Wharf (47°59'37"N., 122°13'22"W.): 700-foot berthing space; 37 feet alongside; 36,000 square feet of covered storage; 20 acres of open storage; receipt and shipment of bulk cargo.

Private Pier:

(242) Scott Paper Co. Dock (47°59'04"N., 122°13'06"W.): 730-foot berthing space with dolphins; 15 to 30 feet alongside; deck height, 20 feet; 18,900 square feet covered storage area; one 15-ton derrick, pulpmill in rear; receipt of woodchips, shipment of baled woodpulp; owned and operated by Scott Paper Co. **Note:** Vessels are requested to berth as far S as possible due to the loading of woodchip barges at the N end of the wharf; the usual berthing space available is 420 feet when the woodchip barge is at the wharf.

Supplies

(243) Water, provisions, and some marine supplies can be obtained. Gasoline and diesel fuel are available for small craft at Everett Yacht Harbor. Fuel oil for large vessels is available only by Seattle-based tank barges.

Repairs

(244) There are no facilities for repairs to deep-draft vessels in Everett; the nearest such facilities are in Seattle. There are several boatyards. The largest yard, on the E side of the yacht harbor, has a marine railway that can handle craft to 120 feet and a 350-ton lift for hull, engine, or electronic repairs. Machine shops are available at the yard.

(245) **Everett Yacht Harbor,** operated by the Port of Everett, is about a mile above the mouth of and on the E side of the Snohomish River Channel. There are berths for more than 2,200 small craft; transient mooring floats are maintained for visiting boats. A pump-out station and 35-ton travel lift are available. A boatyard is on the NE side of the harbor. (See the small-craft facilities tabulation on chart 18423 for services and supplies available at Everett.) A **harbormaster**, whose office is on the S side of the harbor, assigns all berths.

(246) A launching ramp and pump-out station, operated by the Port of Everett, are on the E side of the channel just N of Everett Yacht Harbor.

Communications

(247) Everett is served by a railroad. The county airport, Paine Field, is 6 miles SSW of the city.

(248) **Snohomish River,** once heavily traveled by the light-draft river steamers and loggers, flows down through the dredged channel and settling basin near the yacht harbor and empties into Port Gardner just W of East Waterway. Traffic on the river above the yacht harbor consists of log tows, tugs and barges, and pleasure boats. Several pulp, plywood, and lumber mills are along the river.

(249) The Snohomish River is crossed by a railroad swing bridge with a least clearance of 9 feet about 0.6 mile E of Preston Point. U.S. Highway 529 crosses the river just above the railroad bridge and has a lift bridge with a least clearance of 38 feet. Interstate 5 crosses the river about 1.6 miles above the U.S. Highway 529 bridge; this fixed bridge has a clearance of 66 feet. (See **117.1 through 117.59 and 117.1059** , chapter 2, for

drawbridge regulations.) A marina is 0.5 mile upstream from the U.S. 529 highway bridge. There is dry storage for over 1,000 craft to 40 feet long; transient mooring floats are available for visiting craft. Gasoline, water, ice, limited marine supplies, and hull and motor repairs are available. A city park with a launching ramp is 1.2 miles upstream from the U.S. 529 highway bridge. The practical limit of navigation on the Snohomish River is 0.8 mile above the Interstate 5 highway bridge.

Chart 18443

(250) The flats N of Everett at the mouths of **Steamboat Slough** and **Ebey Slough** are used for log storage. Steamboat Slough is crossed by a fixed bridge with a clearance of 41 feet and by three swing bridges with a least clearance of 7 feet. Ebey Slough is crossed by two fixed bridges and two swing bridges. Clearances on the fixed bridges are 41 feet; clearances on the swing bridges are 5 feet. The bridgetender of the drawbridge at Marysville monitors VHF-FM channel 16 and works on channel 13; call sign KZ-2475. (See **117.1 through 117.59 and 117.1059**, chapter 2, for drawbridge regulations.) Overhead power cables with a least clearance of 53 feet cross Steamboat Slough. Navigation across the shallow flats should not be attempted without local knowledge. Local small craft navigate Ebey Slough to **Marysville.** A marina and boatyard are just E of the railroad bridge in the town. Marine supplies, winter boat storage, engine repairs, a-30-ton hoist, and launching ramp are available. There is a public launching ramp just W of the Interstate 5 highway bridge at Marysville.

(251) **Sandy Point,** the S point at the entrance to Saratoga Passage, is a low spit rising abruptly to 100 feet, with bluffs on each side; it is marked by a light.

(252) **Camano Head,** 1.5 miles NNE of Sandy Point, is the SE point of Camano Island. A shoal, with a rock bare at low tide, extends nearly 0.2 mile SE from the point, and is marked by a buoy.

(253) **Tulalip Bay,** 4 miles NW of Everett, is a small cove on the mainland. On the N side are the village of **Tulalip** and the agency buildings of the Tulalip Indian Reservation. The bay is shoal, with rocks extending more than 300 yards S and W from the point on the N side of the entrance. A buoy marks the edge of the shoal water W of the point at the S side of the entrance. Several small wharves and landing floats, mostly dry at low water, are at Tulalip; however, it has no public facilities. There are log-booming grounds in the S part of the bay. Mission Beach, immediately S of the bay, has several private boathouses and float landings.

Chart 18441

(254) **Camano Island** extends between Port Susan and Saratoga Passage. It is irregular in shape and 14 miles in length; the S portion consists of a long, narrow tongue that terminates in Camano Head, 340 feet high. At its N end it is separated from the mainland by **Davis Slough,** and South Pass and West Pass of the Stillaguamish River, all dry at low water. On the shores of the island are several resorts and unincorporated residential tracts.

(255) **Port Susan,** on the E side of Camano Island, extends about 11 miles in a NW direction, terminating in flats which bare and extend over 3 miles wide at its head. There are several resort settlements. Deep water is throughout until nearing the head, where anchorage may be had off the extreme W edge of the flats in about 10 fathoms. Care should be used in approaching and anchoring, as the flats rise abruptly from deep water.

(256) **Stanwood** is in a dairying and farming district on the N side of the **Stillaguamish River** at the junction of **South Pass** and **West Pass.**

(257) **Saratoga Passage,** on the W side of Camano Island, extends some 18 miles in a NW direction from its entrance between Sandy Point and Camano Head. At its N end it connects with Penn Cove and Crescent Harbor, and leads E into Skagit Bay. Depths in the passage are from 100 fathoms at the entrance to 15 fathoms at the Crescent Harbor entrance. There are few outlying dangers, and a midchannel course is clear.

(258) There is considerable traffic in these waters, mostly pleasure and fishing craft, with occasional tugs bound to or from Deception Pass. This is a resort area; along the shores of the islands are several small marinas which provide gasoline, limited berths, launching ramps, and lodgings. Principal commercial products are lumber and fish.

(259) **Langley** is a small town on Whidbey Island about 1.2 miles W of Sandy Point. Tugs often anchor off the beach between Langley and Sandy Point. Langley boat harbor, protected on the N and E sides by a timber breakwater marked by private lights, can accommodate about 25 vessels. Transient berths are available. In March 1988, the reported depths were about 16 feet along the E wall and the floats closest to shore. Water, ice, a launching ramp, 4-ton lift, hull and engine repairs, and gasoline are available. The stores of the town business district are nearby, supplies may be obtained.

(260) **East Point,** 6 miles NW of Sandy Point, is a low sandspit about 300 yards long. It is marked by a light.

(261) **Elger Bay,** on the W shore of Camano Island across Saratoga Passage from East Point, is an open bight 1 mile wide. Tugs anchor here in W and NW winds.

(262) **Holmes Harbor,** entered 8 miles NW of Sandy Point, indents Whidbey Island 5 miles in a S direction. Except for a sand and gravel wharf and a large private boathouse at the head of the harbor, only private pleasure piers are on the shores of Holmes Harbor. Depths range from 30 to 40 fathoms off the entrance to 17 fathoms near the head, where good anchorage, except from N weather, may be had in mud bottom. A **general anchorage** is in Holmes Harbor. (See **110.1 and 110.230**, chapter 2, for anchorage limits and regulations.) **Rocky Point,** at the E side of the entrance, is low but rises abruptly to 500 feet. **Baby Island** is a small islet 0.2 mile off the point. Shoals, marked by a buoy, extend NW from the island.

(263) **Greenbank,** a small farming settlement, is on the W side of Holmes Harbor at the entrance. It has a store and service station. Anchorage against W weather is available off Greenbank in 12 to 18 fathoms, muddy bottom. **Freeland,** the business center for this area, is a small town at the head of Holmes Harbor.

(264) **Camano,** a settlement on the E side of Saratoga Passage, is 3.5 miles NW of **Lowell Point.** A light is on **Onamac Point,** 0.8 mile N of Camano. A private buoy marks a fish haven off the point.

(265) **Penn Cove** indents the W shore of the basin at the head of Saratoga Passage and extends W for about 3.5 miles. In most weather, the cove affords good protection in 5 to 15 fathoms, good holding ground.

(266) Off **Snatelum Point,** the S point at the entrance to Penn Cove, is a narrow spit extending N 0.5 mile, with ½ fathom near its end. The spit is marked by a buoy.

(267) **Blowers Bluff,** the N point at the entrance to Penn Cove, is bare, light-colored, high, and rounding. Rocks lie offshore 200 yards at places along the bluff. The shoal extending off the SW end of the bluff reaches almost one-third the distance across Penn Cove. Vessels should favor the S shore when passing this shoal.

(268) **Coupeville,** the county seat of Island County, is on the S shore of Penn Cove, about 2 miles from the head. The town has stores and service stations. A wharf here extends to about 12 feet; berthage and gasoline are available at floats attached to the E side of the wharf. Diesel fuel is available by truck. A rock covered 15 feet is about 300 yards NE of the wharf. A launching ramp is about 0.3 mile E of the wharf.

Chart 18428

(269) **Oak Harbor**, which indents the N shore of Saratoga Passage W of Crescent Harbor, is a semicircular cove about 1 mile in diameter with depths of 20 to 9 feet. **Maylor Point,** the E point of the entrance, is foul with several rocks, awash at low water, 0.5 mile SE from the point. The natural entrance channel is marked by lights, daybeacons, a lighted buoy, and an unlighted buoy. In January 1985, shoaling to an unknown depth was reported to extend about 200 yards NE of Light 5; caution is advised. The town of **Oak Harbor** is on the N shore of the harbor. A marina, operated by the town, is on the E side of Oak Harbor. The marina is protected on the S and W sides by breakwaters. A light on the end of the S and W breakwaters mark the marina entrance at its SW corner. Berthing, electricity, gasoline, diesel fuel, water, ice, a launching ramp, pump-out station, and a lift up to 3 tons are available.

(270) **Crescent Harbor,** immediately E of Oak Harbor, is a semicircular bight 2 miles in diameter, between **Forbes Point** and **Polnell Point.** Polnell Point is wooded and rather bold, and connected to the main island by low ground, giving the point the appearance of an island from a distance off. A shoal extends about 0.9 mile W of Polnell Point; another shoal extends about 0.2 mile S from this point. Shoals extend about 0.7 mile S and E from Forbes Point; the S shoal is marked by a lighted buoy. Foul ground surrounds these points, but otherwise the harbor is clear, affording anchorage in 10 to 11 fathoms, muddy bottom. The harbor is exposed to the S. The large pier of the U.S. Naval Air Station, Whidbey Island, extends from the W side of the harbor. Depths of 26 feet are alongside the outer two-thirds of the pier. This pier can be used only with permission. Services and/or provisions cannot be provided, and ships' own power must be relied upon. A 183-foot T-pier used for fueling Naval vessels is on the N side of the main pier near the shoreward end.

Charts 18421, 18441, 18400

(271) The entrance to **Skagit Bay,** southern part, lies between Polnell Point and Rocky Point. The bay is about 12 miles long in a WNW direction. The greater portion of it is filled with flats, bare at low water, and intersected by numerous channels discharging the waters of Skagit River.

(272) A natural channel varying in width from 0.2 to 0.6 mile and marked by lights and buoys follows the E shoreline of Whidbey Island to the N end of the bay. Shoal water extends off for some 100 to 300 yards from the E shore of the island. The N part of Skagit Bay is described in chapter 12.

(273) The controlling elevation of the flats at the mouth of South Fork is about 2.5 feet above mean lower low water, and the controlling depth at low tide depends on the river stage, probably not exceeding 1 foot during periods of minimum flow. The diurnal range at the

mouth of the river is 11.3 feet. The extreme range at this point is estimated to be 20 feet.

(274) A fixed highway bridge with a clearance of 10 feet crosses the South Fork at **Conway,** 4.8 miles above the mouth.

(275) **Utsalady,** a small village on the N shore of Camano Island about 1.2 miles E of Rocky Point, has a store. Vessels may anchor just E of **Utsalady Point** in a small inlet between the shoal water of the flats and the shore in 3 to 6 fathoms, muddy bottom, with shelter from S winds. In the 1860's Utsalady became the first shipbuilding port in Puget Sound.

(276) **Strawberry Point,** about 2.5 miles N of Utsalady Point, is marked by a light.

(277) The **South Fork** channel leading into Skagit River winds through the flats N of Camano Island. Because of shoaling, however, the channel has largely been abandoned by boat traffic to Mount Vernon except for local outboard boats; **North Fork** is used instead. In December 1971, the mouth of the North Fork bared 2 feet at MLLW. There are several small-boat moorings along the banks of the river at **Mount Vernon.**

Charts 18440, 18477, 18476

(278) The entrance to **Hood Canal** is at the lower end of Admiralty Inlet, between Foulweather Bluff and Tala Point, about 10 miles S of Marrowstone Point. It extends in a general S direction for about 44 miles and then bends sharply NE for 11 miles, terminating in flats bare at low water. The head of Case Inlet, in the S part of Puget Sound, is less than 2 miles from the head of Hood Canal. The shores are high, bold, and wooded, and the water is deep, except at the heads of the bays and at the mouths of the streams. Many small craft ply these waters. There are mostly small float-landings and private docks in the canal.

(279) U.S. Highway 101 follows much of the W shore of Hood Canal, and connecting highways to Port Orchard follow the S shore of the S part of the canal around The Great Bend. There are road connections with Port Orchard and with the Puget Sound highway system from all the settlements on the E shore of the canal.

(280) Water traffic in general is confined to tugs with log rafts, naval vessels in the upper part, and many pleasure craft. Hood Canal is a vacation area. Numerous private houses and summer cottages with small piers, mooring buoys, and floats are on both sides of the canal. There are relatively few public floats or piers, and the only commercial activities are logging and some oystering.

(281) The **tidal currents** in Hood Canal at times attain velocities exceeding 1.5 knots. In some places in the canal the currents are too weak and variable to predict. At times there are heavy tide rips N of and around Foulweather Bluff, sufficiently heavy to be dangerous to small boats and to break up log rafts. This is most pronounced when the ebb current from the main body of Puget Sound meets that from Hood Canal off the point, and particularly so with the ebb against a strong N or NW wind. Off Point Hannon and Hazel Point, tide rips occur at times sufficiently strong to be troublesome to tugs with log tows. Current observations taken at a station in midchannel E of Hazel Point show that directions of both flood and ebb vary considerably at that location. At times SW winds from Hood Canal and N winds from Dabob Bay cause a chop dangerous for small boats. Under these conditions smoother water is found near either shore.

(282) The dangers are few and generally close inshore. A few low sandspits from 100 to 300 yards long are difficult to see at night, but most of them have been made into resorts and the buildings nearby show up well against the background of trees. Flats off the mouths of streams extend as much as 0.5 mile offshore and are extensive at the heads of some of the bays. A midchannel course is clear until reaching The Great Bend, where Hood Canal turns E. Here the N shore just E of Ayres Point should be favored to clear the flats extending from the E part of Annas Bay.

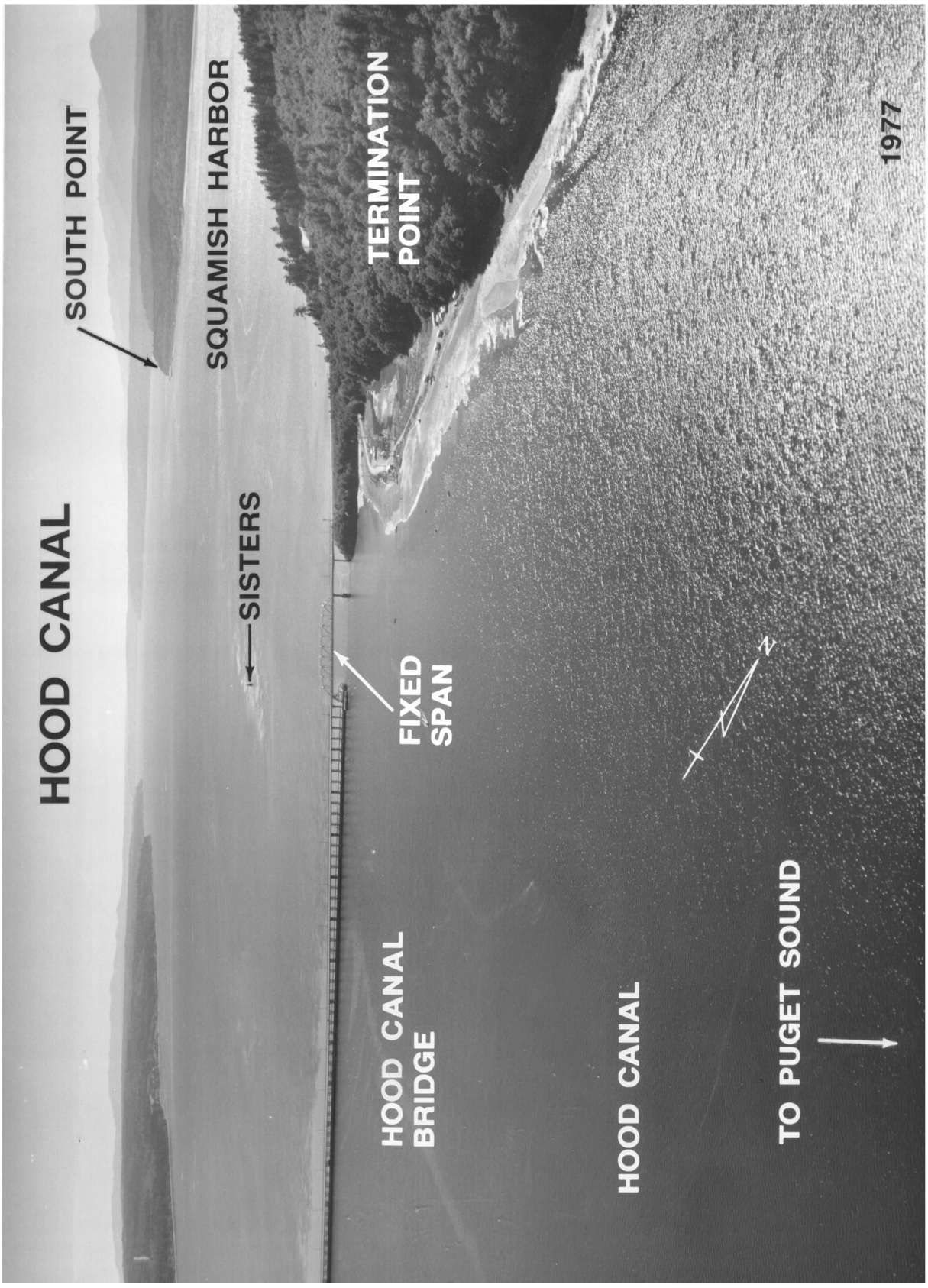
Chart 18477

(283) **Twin Spits** are two long, low, sand points, 0.5 mile and 1 mile S of Foulweather Bluff. When waiting for smooth weather to round Foulweather Bluff, tugs with log tows often anchor in 50 feet 1 mile SE of the S spit, in a bight known locally as **Races Cove,** with Colvos Rocks Light slightly clear of the end of the S point of Twin Spits.

(284) **Hood Head,** on the W side of Hood Canal about 3 miles S of the entrance, is almost an island, having only a narrow strip of low sand connecting it with the W shore. The head is 220 feet high, steep and wooded, and is a prominent feature in the entrance.

(285) A rocky ledge, marked by some kelp and covered 4 to 26 feet, extends more than 500 yards S of Hood Head; rocks covered 4 feet are near the S end of this ledge about 325 yards S of Hood Head. An aquaculture site, marked by lighted private buoys, is about 0.4 mile S of Hood Head.

(286) **Coon Bay,** 2.5 miles S of Foulweather Bluff, is a small, nearly landlocked harbor offering excellent protection to small craft during periods of rough weather. The privately dredged entrance channel is narrow and has a reported controlling depth of about 3 feet. There


HOOD CANAL
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SISTERS
TERMINATION POINT
FIXED SPAN
HOOD CANAL BRIDGE
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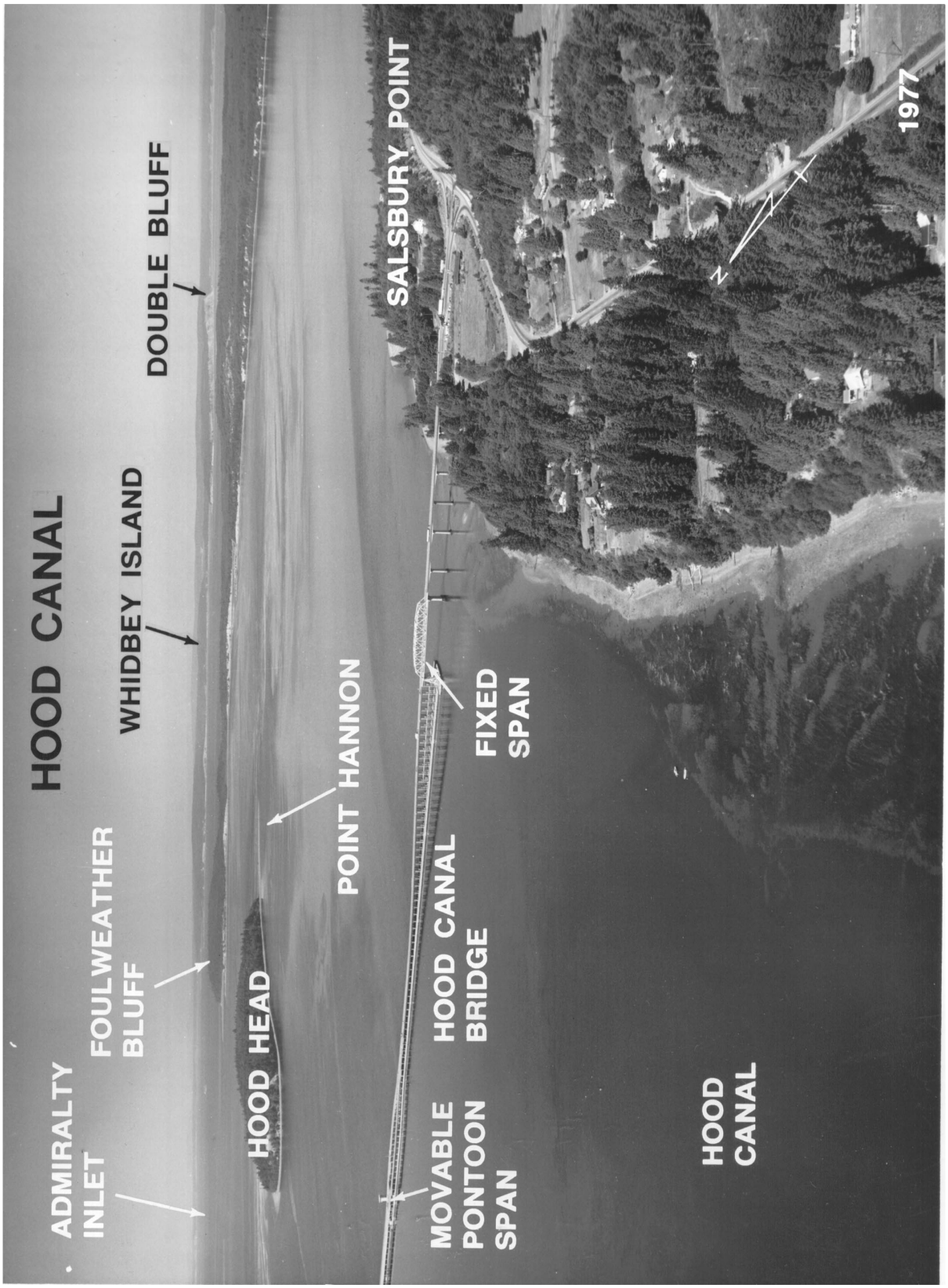
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ADMIRALTY INLET
FOULWEATHER BLUFF
WHIDBEY ISLAND
DOUBLE BLUFF
HOOD HEAD
POINT HANNON
SALSBURY POINT
MOVABLE PONTOON SPAN
HOOD CANAL BRIDGE
FIXED SPAN
HOOD CANAL
1977

are several private piers inside the entrance, but no facilities are available.

(287) **Point Hannon** is at the E extension of Hood Head; it is marked by a light. A low sandy spit with shoal water extends about 200 yards E of the light.

Local magnetic disturbance

(288) Differences of more than 2° from normal variation have been observed in Hood Canal at Point Hannon.

(289) **Termination Point,** 1.6 miles E of the village of **Shine,** is 1.7 miles SW of Point Hannon. A lighted transformer substation is on Termination Point. An aquaculture site, about 400 yards ENE of the point, is marked by private lighted buoys.

(290) **Hood Canal Bridge,** a pontoon highway bridge crossing the canal between Termination Point and Salsbury Point W of Port Gamble has two fixed openings; the clearance of the W opening is 35 feet, and that of the E opening is 55 feet. In the 600-foot center opening there are pontoons which are retracted for larger vessels. The bridgetender monitors VHF-FM channel 16 and works on channel 13; call sign, WHD 721. (See **117.1 through 117.59 and 117.1045**, chapter 2, for drawbridge regulations.) A private fog signal is at each opening. Anchor cables, extending from the bridge pontoons to the canal bottom, extend nearly 500 yards both N and S of the bridge; anchoring should not be attempted in this area.

(291) **Sisters,** two rocks 200 yards apart, 0.5 mile S of Termination Point, are awash at about half tide. A light is on the S rock, 0.4 mile from the N entrance point to **Squamish Harbor,** an open bight just SW of Termination Point. Tugs frequently anchor near the head of the harbor in about 6 fathoms, muddy bottom.

(292) **Case Shoal,** partly bare at low water, is about 0.6 mile from and parallel with the W shore of Squamish Harbor. The shoal is marked at its N end by a daybeacon and on its SE side by a light. A clam tract, marked at the N and S ends by private buoys, is in the SW part of the harbor between Case Shoal and the W shore.

(293) **Port Gamble Bay** is a small bay on the E shore of Hood Canal 5 miles from the entrance. It is 2 miles long with a narrow entrance.

(294) A dredged entrance channel leads from deep water in Hood Canal into deep water in Port Gamble Bay. In July 1986, the controlling depth was 23 feet. The channel is marked by a **001°-181°** lighted range and two lights on the E side of the channel.

(295) **Port Gamble,** the town on the W shore at the entrance, is owned by the lumber company which maintains all facilities including the local housing, church, and store. The mill has been in operation for more than a century. The white church steeple and flagpole in the town are prominent. A shoal covered 4 feet is about 500 yards NE from the N end of the lumbermill wharf. The lumbermill wharf has a 385-foot face with reported depths of 29 to 35 feet alongside, a 400-foot berth at the S end of the wharf with 36 feet reported alongside and a 170-foot berth at the NW end of the wharf with 24 to 29 feet reported alongside. All deck heights are 14½ feet. Strong currents on both flood and ebb tide are experienced through the entrance channel to Port Gamble Bay. Vessels should dock against the current. Local knowledge and careful, precise piloting are essential in docking at this wharf.

(296) Excellent anchorage may be had in the bay in 24 to 54 feet, muddy bottom.

(297) Vessels should hold a midchannel course on entering Port Gamble Bay until 200 yards or more past the S light, and then head for the wharf, keeping the long E face open to avoid shoal water on the W side of the channel.

(298) **Caution.**–The entrance channel to Port Gamble Bay is quite constricted by shoals on both sides of the channel. The two lights on the E side of the channel are in shoal water and do not mark the edge of the channel.

(299) A bridge pontoon storage area is on the W side of Port Gamble Bay about 0.4 mile S of Port Gamble.

Charts 18458, 18476, 18477, 18441

(300) **Thorndyke Bay** is a small bight on the W side of Hood Canal about 4 miles S of Squamish Harbor. An **explosives anchorage** is S of the bay. (See **110.1 and 110.230**, chapter 2, for limits and regulations.)

(301) **Bangor Wharf** on the E side of the canal, 3.5 miles S of Thorndyke Bay, is the property of the Bangor U.S. Naval Submarine Base. A **naval restricted area** surrounds the wharf and other naval docking facilities along the E side of Hood Canal. Keyport Naval Undersea Warfare Engineering Station, 0.9 mile SSW of Bangor Wharf, is also within the restricted area. (See **334.1220**, chapter 2, for limits and regulations.) **Naval security zones** are adjacent to the Naval Submarine Base. (See **§165.1302 and §165.1311**, chapter 2, for limits and regulations.) A 500-foot radio tower, marked by red aircraft warning lights, is on Bangor Wharf and is prominent. A 459-foot red and white radio tower, marked by red aircraft warning lights, is on the wharf 0.3 mile NNE of Bangor Wharf; this tower is also prominent. It is reported that vessels southbound from Hood Canal Bridge can use the towers as a **200.6°** range. Strong currents are in the vicinity of the piers at Keyport Naval Undersea Warfare Engineering Station.

(302) A **naval operating area** is in the S part of Hood Canal. (See **334.1190**, chapter 2, for limits and

regulations.) A **naval exercise area** extends N from the N boundary of the operating area to just off **South Point,** about 2.3 miles NE of Thorndyke Bay.

(303) **Bangor,** a small residential community about 2 miles S of Bangor Wharf, has no facilities.

(304) **Seabeck,** about 6 miles SW of Bangor, is a settlement and resort at the head of **Seabeck Bay,** a small cove on the E shore. A marina, protected by a breakwater awash at high water, is on the S side of the bay. Berths, gasoline, diesel fuel, water, ice, supplies, and a 1½-ton hoist are available. Shoal water extends 0.5 mile from the head of the bay. Good anchorage, well protected from SE to SW weather, is available in the bay in 35 to 50 feet. Shoal water extends more than 200 yards off **Misery Point,** at the W side of the entrance of the bay. A light is about 300 yards NE of Misery Point, and a fish haven is close NW of the light.

(305) **Oak Head,** 2 miles NNE of Misery Point and marked by a light, is the S point of **Toandos Peninsula. Hazel Point,** 1.8 miles ENE of Oak Head, is the turning point where the canal bends sharply from S to SW.

(306) **Fisherman Harbor** is a cove on the S end of Toandos Peninsula, just E of Oak Head. It is very narrow, with a constricted entrance which is practically bare at low water. A sandspit extends partly across the entrance from the W shore.

(307) **Brinnon** is a village on the S side of Dosewallips River, 3.5 miles W of Oak Head, at the entrance of Dabob Bay. It has a general store and service station. Gasoline, water, and ice are available, but there is no landing pier. A log booming ground is close offshore at Brinnon.

(308) **Dabob Bay,** the largest inlet in the canal and separated from it by Toandos Peninsula, extends 9 miles in a N direction. The entrance is between **Tskutsko Point** and **Sylopash Point** just N of the mouth of Dosewallips River. A light is off Tskutsko Point. The W shore of Dabob Bay is particularly steep and bold, reaching an elevation of over 2,600 feet in less than 2 miles from the coast.

(309) A **naval operating area** is in the bay. Unlighted spherical yellow mooring buoys may be temporarily established within the bay. Navy–maintained warning lights are shown from **Whitney Point,** Pulali Point, and Sylopash Point on the W side of the bay, from **Zelatched Point** on the E side of the bay, and on the SE side of Bolton Peninsula on the N side of the bay. Flashing amber lights indicate that naval operations are in progress and all craft should keep well clear of vessels engaged in testing. Flashing red lights will be shown when naval operations close the area to navigation. Craft on the bay during these periods should stop their screws and secure their engines and depth sounders. Mariners are advised to pass no closer than 1 mile of naval vessels engaged in bottom operations unless directed otherwise by radiotelephone or other signal from the shore, picket boat, or surveillance aircraft. (See **334.1190**, chapter 2, for limits and regulations.)

(310) A **restricted area** is off Whitney Point. (See **334.1260**, chapter 2, for limits and regulations.)

(311) **Quilcene Bay** is a small inlet on the W side of Dabob Bay N of Whitney Point. A light marks the E side of the entrance to the bay. The N half of the bay is filled with flats which bare. This part of the bay has two log booms and log storage areas. An oyster farm is on the E side of the bay just inside the entrance. Floats with mooring buoys evenly spaced along the E edge mark the oyster farm. **Quilcene,** a small town on the W side and near the head of the bay, is about 0.5 mile inland. The town has hotels, restaurants, and stores.

(312) **Quilcene Boat Haven,** is on the W side of the bay about 1.4 miles S of the town. The entrance to the haven is protected by a stone breakwater; mooring floats for over 50 small craft and gasoline are available. The basin has a reported controlling depth of 10 feet. Two oyster farms are near the haven.

(313) **Pleasant Harbor** is a small cove on the W shore of Hood Canal about 3 miles W of Misery Point. It is about 300 yards wide, and has a narrow shallow entrance. Owing to the narrowness of the entrance, boats should keep in midchannel until clear of the 6-foot shoal. Two marinas inside the harbor have berths for about 250 craft, electricity, gasoline, water, ice, and limited marine supplies. Anchorage in about 36 feet, mud bottom is available inside the harbor. A state park pier is in the harbor.

(314) **Triton Head,** on the W shore, is 8.2 miles SW of Oak Head. It is low, rocky, and timbered, with a reef that bares extending 200 yards N from the point. **Triton Cove** is a small cove formed by the head and the W shore, which affords anchorage for small craft against S winds. Oyster beds, marked by stakes and brush, are about 0.8 mile N from Triton Head on the flat which extends off the mouth of **Fulton Creek.** Two resorts just S of Triton Head have berths, gasoline, diesel fuel, water, ice, dry storage, and marine supplies. Hoists and railways to 10 tons are available, and outboard engine repairs can be made.

Charts 18448, 18476

(315) **Holly** (47°33.5'N.,122°58.6'W.), on the E shore of Hood Canal, is a settlement on the S side of a small bight about 10 miles SW of Oak Head. There are no facilities here. Shoal water extends about 300 yards N and E from the S shore of the bight. **Anderson Cove** is the shallow cove directly N of Holly.

(316) **Eldon** is a W shore settlement on the S bank of **Hamma Hamma River,** about 3 miles SW of Holly. The delta flats of the Hamma Hamma River extend nearly 0.5 mile from shore. Unmarked jetties extend from the river through the flats into Hood Canal and constitute a potential hazard to small craft.

(317) **Lilliwaup** is a village on the S shore of **Lilliwaup Bay,** a small shallow cove on the W shore of Hood Canal about 6 miles SW of Eldon.

(318) About 1 mile S, there is a resort at which berths, electricity, gasoline, diesel fuel, water, ice, and marine supplies are available. A 1½-ton elevator at the resort can handle craft to 19 feet long for hull and engine repairs.

(319) **Dewatto** is a small settlement on the S side of **Dewatto Bay,**a small, shallow cove on the E shore opposite Lilliwaup.

(320) **Hoodsport,** the largest town on Hood Canal, is on the W shore 4 miles SW of Dewatto. It has a State fish hatchery.

(321) **Hoodsport Marina,** with a pier and floats, has depths of 12 feet reported off the end of the pier. Berths, electricity, water, ice, and marine supplies are available. Just N of the marina is a public pier with floats.

(322) **Potlatch** is a small town on the W side of the canal about 2 miles S of Hoodsport and opposite **The Great Bend,** where Hood Canal turns NE. The large gray building of a hydroelectric powerplant, connected to a standpipe on the mountain above by three pipelines, is very prominent on the W shore 0.5 mile S of the town. There is a recreation park and small-craft launching ramp just S of the powerplant.

(323) **Union** is a town with several stores on the S shore of The Great Bend. There are two marinas here; one has a 4-ton hoist that can handle craft to 30 feet long for hull and engine repairs. Both have berths, electricity, gasoline, water, ice, marine supplies, and facilities for making hull and engine repairs. Depths alongside the floats at these marinas are reported sufficient for small craft at all stages of the tide; however, the westernmost of the two marinas should be approached from the NE to avoid shoal water and snags. A large resort in the cove on the S shore 1.3 miles E of Union has a T-pier with a 600-foot face and reported depths of 15 feet alongside. Berths, electricity, and water are available at the resort. A large motel and restaurant are here.

(324) **Annas Bay,** immediately W of Union, is a broad, open bight; the E half is flat and bare at low water. This flat extends about 0.2 mile into the canal immediately W of Union and is formed by the **Skokomish River,** which empties at the head of the bay.

(325) **Tahuya,** a small town on the N shore of The Great Bend 1.8 miles NE of Union, has a resort with a pier and floats, about 0.75 mile W of the town. Electricity, gasoline, water, a 1½-ton hoist, and a launching ramp are available. Reported depths of 2½ feet are off the floats. **Twanoh State Park,** about 6 miles E of Union on the S shore, has three launching ramps and a pier with reported depths of 2½ feet off the end. A small marina, operated during the summer is about 2 miles E of Twanoh State Park on the N shore. A pier with mooring floats, gasoline, and water are available. A float where gasoline is available is about 2.5 miles from the head of Lynch Cove on the N shore, and about 0.5 mile SW is a public pier with floats operated by the **Port of Allyn.** The end of the pier is marked by lights. A reported depth of 10 feet is off the end of the float.

(326) Hood Canal terminates in **Lynch Cove.** Flats, mostly bare at low tide, extend for about 2.2 miles from the head of the cove.

Charts 18446, 18449

(327) **Port Orchard** is an extensive body of water, W of **Bainbridge Island,**15 miles long. Its N end connects with Port Madison through Agate Passage. At its S end Port Orchard connects with Puget Sound through Rich Passage. The depths in the main body of Port Orchard range from 36 to 150 feet with few dangers and these, as a rule, are close inshore. The shores are moderately low and wooded. Villages and numerous cottages line the shores.

Current

(328) Current observations taken in midchannel about 1 mile S of **Tolo** indicate that the tidal current in that locality is very weak.

Chart 18446

(329) **Agate Passage** is the N entrance to Port Orchard and connects it with Port Madison. The channel extends about 1 mile in a SW direction. The depth is about 20 feet. The passage is straight; the shores are wooded and fairly steep-to; the shoreline is mostly rocky and fringed with kelp to Point Bolin. The currents have velocities up to 6 knots; the flood sets SW and the ebb NE.

(330) The passage is obstructed by a shoal, marked by a light, near the middle of the N end with depths of 9 to 10 feet, and there are other depths of 14 to 18 feet almost in midchannel.

(331) The N entrance is marked by a light on the W side of the channel opposite **Agate Point;** a lighted buoy marks the channel through the passage and a light marks a shoal NE of **Point Bolin.**

(332) A fixed highway bridge, 0.7 mile S of Agate Point, has a clearance of 75 feet for a midwidth of 300 feet. Overhead power cables cross the passage on both sides of the bridge; least clearance is 96 feet.

(333) **Liberty Bay** is a narrow inlet extending about 4 miles in a N direction from the NW part of Port Orchard. The SE half of the bay is narrow and tortuous. The shores are low and wooded; the shoreline is mostly sand and gravel. There are mud flats at the head of the bay and in the small bight on the S side of the bay. Mud is the predominating bottom characteristic. The current velocity is 0.8 knot N of Keyport, in the narrow entrance to the bay. Velocities exceeding 1 knot occur at times.

(334) The **Keyport Naval Underwater Warfare Engineering Station (NUWES)** on the W side of the entrance to Liberty Bay has two piers. A seaplane float extends 100 feet NW from the end of the N pier. Mariners are requested not to exceed 5 knots when passing the S pier, and not to exceed 3 knots when passing the N pier. Several buildings are prominent at the station.

(335) A **torpedo test area** extends off the shore between Brownsville and Keyport NUWES. Flashing red lights on Navy range vessels between Keyport and Brownsville and atop a building at the seaward end of the S pier at Keyport NUWES indicate torpedo firings, or that noise measurement tests are in progress, or that conditions are generally hazardous to mariners. When lights are flashing, mariners should not enter the test area. Mariners near the area should stop engines, or other equipment generating underwater noise, such as depth sounders, because some torpedoes are guided by noise and may be attracted to the boat noises. (See **334.1230**, chapter 2, for limits and regulations of the restricted area.)

(336) **Keyport** is on the S side of the passage leading to Liberty Bay. A power cable with a clearance of 90 feet crosses the passage at Keyport. There are two piers with floats that can accommodate about 42 small craft. A store with gasoline pumps is about a half block from the Keyport launching ramp. A marine railway that can handle craft to 42 feet is available for repairs; a 7-ton hoist is also available. Engine and hull repairs and salvage and towing services are available at Keyport.

(337) **Poulsbo,** a fishing and pleasure resort on the E shore at the head of Liberty Bay, is the principal town of the area. The small-craft harbor at Poulsbo, protected on the S and W sides by an angled timbered breakwater, can accommodate about 400 fishing boats and pleasure craft. The breakwater is well marked by private lights. Piers and floats are in the harbor; depths are about 12 feet at the outer floats. The NE float, parallel to the shore, is use by seaplanes. Electricity, water, ice, a launching ramp, a pump-out facility, a marine railway to 30 tons, a 50-foot tidal grid, and hull and engine repairs are available at the basin. A yacht club and a restaurant are here. The stores of the town business district are nearby, and all types of supplies may be obtained. A tall church steeple on the hill NE of the harbor is prominent.

(338) Oysters are cultivated on the flats at the head of the bay. There is an oyster company plant about 0.6 mile SE of the Poulsbo. A covered rock is about 175 yards SE of the oyster wharf. A marina immediately S of the oyster company plant offers berths with electricity for about 140 small craft; a 30-ton marine railway and engine repairs are available.

(339) **Manzanita** is a settlement on the W side of Bainbridge Island in a small cove about 2 miles S from Agate Passage. **Manzanita Bay,** S of the town, affords an excellent anchorage for small craft in 27 feet, mud bottom. There are several private wharves and floats in the bay. Caution is urged to avoid rows of submerged piling on each side of the bay, about midway in from the entrance.

(340) **Battle Point,** a sandy spit on the E side of Port Orchard about 1.7 miles S of Point Bolin, marks the turn in the direction of the channel from SW to S. A light is off the end of the spit.

(341) **Brownsville,** on the W shore of Port Orchard, is on the N shore of **Burke Bay,** about 1.2 miles SW of Battle Point. Brownsville has a marina with berths for about 250 vessels. Transient berths are available. The reported depth alongside is 8 feet. Electricity, gasoline, diesel fuel, water, ice, and supplies are available. The marina has a marine railway that can handle craft for hull and engine repairs up to 26 feet. The **harbormaster's** office is on the second floor of the town store. All of Burke Bay bares, but it may be entered by small craft at about half tide.

Chart 18449

(342) **Illahee** is a small settlement on the W shore of Port Orchard about 3.0 miles S of Battle Point. The town has a wharf and stores. A fish haven, marked by buoys and extending about 140 feet from the outer end of the wharf, provides marine habitat improvement for scuba diving and public fishing; mariners are advised to use caution. About 1 mile S of Illahee at **Illahee State Park** is a public pier with floats for small craft and a launching ramp. A rock awash was reported about 50 yards SE of the pier in about 47°35'59.8"N., 122°35'32.1"W.; caution is advised in the area.

(343) **Fletcher Bay** is a village on the E shore of Port Orchard about 1.2 miles S of Battle Point. Small boats can enter the bay at three-quarter tide and find anchorage

in 12 feet, mud bottom; the swinging area is limited. The bar across the entrance bares at half tide.

(344) The E and principal approach to Port Orchard from Puget Sound is S of Bainbridge Island through Rich Passage, between Restoration Point and Blake Island. It is deep and almost free from dangers, except for **Bainbridge Reef,** covered 35 to 55 feet, and currents in the constricted W part of Rich Passage. Bainbridge Reef is marked at the SW end by a lighted buoy.

(345) **Orchard Point,** the S point at the entrance to Rich Passage, is marked by a light and fog signal. A **general anchorage** is in the vicinity of the point. (See **110.1 and 110.230**, chapter 2, for limits and regulations.)

(346) **Rich Passage** is about 3 miles long, with a sharp bend near its W end, where it narrows to 0.2 mile. **Orchard Rocks,** some 400 yards in extent, are on the N side of the channel just inside the E entrance. A small area near the center of the reef, which uncovers, is marked by a daybeacon. The rocks are marked off their S end by a lighted buoy. The reef off **Point Glover** is marked by a light and fog signal. **Waterman Point,** at the W entrance, is marked by a light and fog signal. A light marks the S edge of the shoal extending from **Point White,** the N point at the W entrance. The town of **Waterman** has a pier and float in deep water about 1 mile SW of Waterman Point.

Currents

(347) Continuous observations in midchannel between Point Glover and Point White and at other points in the passage indicate that: Current velocities increase from E to W in Rich Passage reaching a maximum average velocity of 2.4 knots on the flood and 3.1 knots on the ebb at the W end off Point White. The strongest observed currents were 4 knots on the flood and 5 knots on the ebb. Ferry pilots on the regular daily run between Seattle and Bremerton advised that on rare occasions they have experienced ebb currents of "at least" 6 knots in the vicinity of Light 10.

(348) Near the time of slack, the average period when the velocity does not exceed 0.2 knot is about 20 minutes. For strong currents these periods will be decreased; for weak currents they will be increased.

(349) In the channel off Orchard Point, at the E end of Rich Passage, the velocity of the flood is 0.8 knot and on the ebb, 1.1 knots. Off Pleasant Beach the velocity of the flood is 1.3 knots and on the ebb, 2.8 knots.

(350) On the flood, the lines of stream flow are nearly uniform except off the bight just NW of Middle Point and in the large cove on the N shore opposite Point Glover. Eddies do form in those two places, but they do not extend outward to the usual vessel track. On the ebb, however, extensive eddies and countercurrents do occur, owing to the funnel-shaped configuration of the passage.

(351) Between Middle Point and Point Glover, an extensive eddy extends from shore almost to midchannel, and will frequently be encountered by vessels on the track between Orchard Rocks and Point Glover buoys.

(352) An eddy fills the cove on the N shore opposite Point Glover, but does not extend outward to the vessel track.

(353) An eddy occurs about 0.2 mile SSW of Point White and a little N of midchannel at the W entrance to the passage. A weak countercurrent occurs inshore along the SE side of Point White.

(354) These eddies and countercurrents on the ebb greatly diminish the effective width of the passage, and so increase the velocities in the channel.

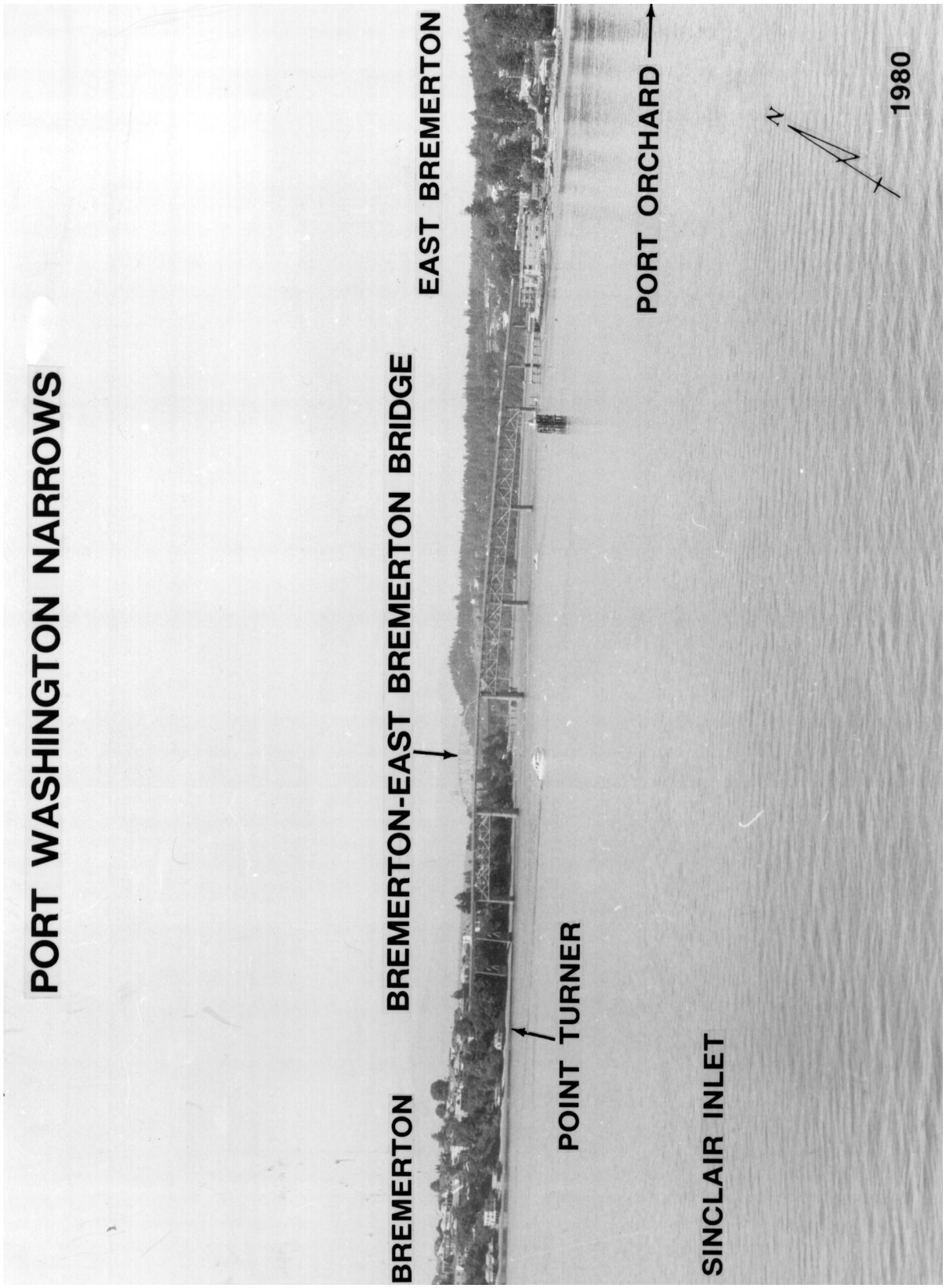
(355) Mariners unfamiliar with the area should not attempt to navigate Port Orchard, and particularly Rich Passage, in thick weather because of the strong tidal currents. In clear weather, however, the navigation of these waters presents no unusual difficulty.

(356) **Caution.–Rich Passage,** because of activities of the Puget Sound Naval Shipyard, has a large volume of traffic. Many ferries a day each way, tugs with hawser tows, and various types of naval craft, all contribute to create a considerable collision hazard in the passage, particularly at the sharp bend off Point Glover. Strong tidal conditions prevail in this vicinity, and deep-draft outbound vessels making the sharp turn may be unavoidably set well over toward the E shore, necessitating a two-blast, starboard-to-starboard meeting with inbound vessels. Vessels approaching Point Glover from either direction should sound one long blast when within 0.5 mile of the point as a warning to any vessel approaching from the opposite direction.

(357) **Fort Ward,** formerly a military post and now a State park on Bainbridge Island, is near the E entrance to Rich Passage, just inside Beans Point. There is a wharf here built out to 18 feet. A fish pen off the end of the wharf is marked by private lights. An aquaculture site, marked by private lights, is about 300 yards SSW of the wharf in about 47°34'30.5"N., 122°31'29.5"W. A rocky patch covered 11 feet, 150 yards S of the wharf, is dangerous to vessels approaching from southward. A radio tower just NE of Fort Ward and a large white house on **Beans Point** are prominent from the E end of Rich Passage.

Chart 18452

(358) **Sinclair Inlet**, site of the city of Bremerton and the Puget Sound Naval Shipyard, is entered from Rich Passage and Port Orchard on the E, and Port Washington


PORT WASHINGTON NARROWS
BREMERTON
BREMERTON-EAST BREMERTON BRIDGE
EAST BREMERTON
POINT TURNER
PORT ORCHARD
SINCLAIR INLET
1980

Narrows on the N. The inlet is 3.5 miles long, extending in a WSW direction from **Point Herron,** which is at the junction of Port Washington Narrows and Port Orchard. The point is marked by a light and fog signal. Several Navy-maintained unlighted mooring buoys, used at times by unlighted craft, are in Sinclair Inlet. Mariners are advised to exercise caution at night.

(359) **East Bremerton** is the community back of Point Herron, on the E side of the Port Washington Narrows entrance. The fixed highway bridge crossing the narrows here has a clearance of 82 feet.

(360) Sinclair Inlet is a **naval restricted area.** (See **334.1240,** chapter 2, for limits and regulations.)

(361) **Annapolis** is a village on the S shore of Sinclair Inlet directly S of Point Herron. A foot pier extends out to a float which is used by a passenger ferry between the village and Bremerton. E of the ferry pier is a public float and launching ramp. The float grounds at low water. The buildings of a veterans' home on the bluff above the town are prominent.

(362) A flat that bares extends about 0.2 mile from shore in the bight between Annapolis and Port Orchard.

(363) The town of **Port Orchard** is on the S shore about 0.5 mile W of Annapolis. It has a ferry pier, float landing, and a marina. Passenger ferry service is maintained with Bremerton every 15 minutes from 1600 to 2400 daily. A marina, protected on the W, N, and E sides by a floating breakwater, is just W of the ferry pier. The entrance is at the NW corner and is marked by private lights. There are covered and open berths for about 600 small craft. A yacht club has its moorings just inside the W breakwater. Transient berths for small-craft to bout 40 feet are on the E side of the marina; larger transient craft can moor on the inside or outside of the N and E parts of the breakwater. Electricity, water, gasoline, diesel fuel, and pumpout facilities are at the marina; the stores of the town business district are nearby and all types of supplies may be obtained.

(364) A marina and boatyard are on the W side of town; water, ice, limited marine supplies, and diesel fuel are available. The yard has a marine railway that can handle craft up to 75 feet and a floating drydock with a 25-ton capacity. Hull and engine repairs can be done at the boatyard; a machine shop and carpentry shop are available. Port Orchard Yacht Club has its moorings W of the boatyard. A floating breakwater in ruins, a wreck, and other sunken debris are about 75 yards off the ends of the Yacht Club floats. Another marina and boatyard, just W of Port Orchard Yacht Club, can accommodate about 25 vessels. A mobile hoist with a 30-ton capacity can handle craft up to 55 feet. Electricity, gasoline, water, and limited marine supplies are available at the marina.

(365) A marina and boatyard, about 1.5 miles W of Port Orchard, has berths for about 50 fishing boats and small craft. Electricity, gasoline, water, and limited marine supplies are available. The boatyard has three marine railways, the largest of which can handle craft to 30 tons for hull repairs.

(366) **Puget Sound Naval Shipyard** occupies most of the N shore of the inlet. The hammerhead crane near the offshore end of Pier 6 of the yard is one of the most conspicuous objects from any direction. The ends of Pier 4, Pier 5, and Pier 6 are equipped with radar reflectors.

(367) Navy Drydock No. 6 is one of the largest in the world. Its inside dimensions are 1,152 feet long, 165 feet wide at the entrance measured 6 feet over sill, and 53 feet over the sill at mean high water. This facility was built to accommodate the largest supercarrier. When not committed to Navy use, and under certain conditions, the drydock may be used by other ships that are too large for commercial docks.

(368) **Bremerton** adjoins the shipyard, and most of the city's business and affairs are keyed to the needs of the Navy establishment. The city limits include East Bremerton and Point Herron. Frequent ferry service connects with Seattle. Floats for small craft are adjacent to the N ferry slip.

Chart 18449

(369) **Port Washington Narrows**, 3 miles long, joins Sinclair and Dyes Inlets. Tidal currents in the narrows attain velocities in excess of 4 knots at times. (See Tidal Current Tables and Tidal Current Charts for detailed information.)

(370) There are a number of petroleum distribution facilities with storage tanks and receiving wharves along the W shore of Port Washington Narrows between the S bridge over the narrows and Phinney Bay.

(371) Two fixed highway bridges and two power cables cross the narrows. The Bremerton-East Bremerton Bridge, the S bridge, has a clearance of 82 feet. The easternmost support of the bridge has a large concrete footing around the base of the support and is marked by a danger sign. It is reported to be submerged at high tide and considered to be a hazard to navigation. A power cable with a clearance of 90 feet is about 0.3 mile N of the bridge, and a second power cable with a clearance of 80 feet is close E of the N highway bridge. The N bridge has a clearance of 80 feet.

(372) **Anderson Cove** is a small bight on the S shore about 1.5 miles above the East Bremerton Bridge. The cove is shoal; however, it has several private piers and a public launching ramp. A small-craft moorage is 250

yards E of Anderson Cove. Oil wharves are on both sides of the moorage.

(373) **Phinney Bay,** 0.8 mile long, makes into the W shore near the N end of the narrows. Bremerton Yacht Club has its moorage with floats on the W side of the bay. **Rocky Point** is on the W side of the N entrance of the narrows. There are tide rips off this point.

(374) **Dyes Inlet** extends about 3 miles NNW from the N end of the narrows to the village of **Silverdale** on the W side of the head of the inlet. The inlet is used by fishing boats and pleasure craft. There are several villages and many houses on its shores. A dock, mooring floats, and limited marine supplies are available. Some local fishing boats are hauled out by crane for repairs. The village of **Tracyton** is on the E shore just N of the narrows. The village has a public boat launching ramp.

(375) **Chico** is a small residential town on the SW side of Dyes Inlet, close W of Chico Bay; the log dump wharf here is in ruins.

(376) **Ostrich Bay** is an inlet in the SW part of Dyes Inlet. A covered rock is reported in Ostrich Bay 500 yards S of **Elwood Point** inside the breakwater extending S of the point.

(377) That part of the W shore of Ostrich Bay extending about 0.5 mile S from Elwood Point is an annex of the Puget Sound Naval Shipyard. The wharves and shops are no longer used and are in ruins.

(378) A depth of 6 feet can be carried from Ostrich Bay into **Oyster Bay** on midchannel courses. There is 4 feet or more in Oyster Bay.

Charts 18448, 18449, 18474

(379) **East Passage**, on the E side of Vashon and Maury Islands, extends from Alki Point SSE for 12.5 miles to Robinson Point, and thence SW for 6 miles to Browns Point. The waters throughout are deep and free from dangers, which in no case extend as much as 0.5 mile from shore.

(380) **Fauntleroy Cove,** 3.5 miles S of Alki Point, is the site of the landing for the automobile ferry plying from there to Vashon Heights and Point Southworth.

Anchorage

(381) A **general anchorage** is on the W side of the passage in the bight included between Orchard Point and Point Southworth and protected on the E side by Blake Island. (See **110.1 and 110.230**, chapter 2, for limits and regulations.)

(382) Several settlements and resort villages are along the shores of Yukon Harbor; mostly fishermen and pleasure boaters use these waterfront facilities.

Manchester has a short wharf with a float landing and a launching ramp. Two large wharves, one on the S side of **Middle Point** and the other on the S side of **Orchard Point,** are included in the oil storage area of the Puget Sound U.S. Naval Supply Center. **Harper,** a mile WNW of Point Southworth, is the site of a former ferry pier now in ruins. The ferry from Seattle, Fauntleroy, and Vashon Island docks at the slip on Point Southworth.

(383) **Blake Island,** about 1 mile long, 249 feet high, and covered with trees, is off the N entrance to Colvos Passage. Heavy tide rips, strongest with a flood current, and strong S winds are encountered at the N entrance to Colvos Passage S of Blake Island. Shallow, irregular bottom extends about 0.5 mile off the N shore of the island. A light is on the NE point of the island. Just S of the NE point of the island are the ruins of a wharf. A State marine park small-craft basin, protected by a breakwater, is at the NE end of the island. The entrance to the basin is marked by a private light and daybeacons. A pump-out station is available.

(384) **Yukon Harbor,** about 2 miles SW of Blake Island, affords anchorage in 30 to 50 feet, with protection from S winds; much of the head of the harbor bares at low tides.

(385) **Vashon Island** is 11 miles long in a N direction. **Maury Island,** actually a peninsula of Vashon Island at its SE extremity, is connected to it by a highway on a narrow neck of land. Maury Island is about 5 miles long.

(386) On these islands the land is of moderate rolling elevation and in places rugged, and most of the country is heavily wooded. The islands have numerous orchards and houses. There is some farming, and cattle and poultry are raised. The transmitting towers of Seattle broadcasting stations are on the islands; two groups of towers are on Vashon Island and two on Maury Island. The shores on all sides have numerous settlements. The county wharves, formerly used to ship farm produce, are no longer kept in repair, and shipments are now by truck.

(387) **Point Vashon,** the NW tip of Vashon Island, is 305 feet high, steep, and wooded. Shoal water extends 0.2 mile N from the point and nearly as far along the N shore as **Dolphin Point,** 1 mile E. A light is 300 yards N of Point Vashon.

(388) **Vashon Heights Landing,** 0.5 mile ESE of Point Vashon, has a combination ferry slip and landing wharf built out to 14 feet. An automobile ferry runs to Point Southworth and Fauntleroy.

(389) The tall radio towers of station KOMO are on Point Beals. The town of **Vashon** is on high land 1.5 miles SW of Point Beals.

(390) A **159°58'-339°58' measured nautical mile** is E of Point Beals. The range markers are steel towers with round orange targets.

(391) **Three Tree Point,** about 7.8 miles S of Alki Point, is a sharp low spit, projecting 300 yards from the high land which in 1 mile rises to an elevation of 430 feet. On the low part of the point is a grassy knoll, 30 feet high, with several trees on it. A light and fog signal are on the point.

(392) **Tramp Harbor,** formed by the easternmost part of Vashon Island and the N end of Maury Island, has shoal water extending about 0.2 mile out from shore along its entire length. It is bounded on the N by **Point Heyer,** a sandspit behind which the ground rises rapidly. A shoal extends 0.2 mile SE from the point. A radio tower on this point is about 450 feet high. A private buoy marks a fish haven off Point Heyer.

(393) **Portage** is a village extending over both sides of the low isthmus that connects Vashon and Maury Islands. Two radio towers about 526 feet high are 0.6 mile S of the isthmus, and three other radio towers are one mile SE of the isthmus.

(394) There is a large small-craft marina at **Des Moines,** about 4 miles SE of Three Tree Point. A 2,200-foot rock breakwater, marked by a light at each end, offers shelter for over 700 craft in depths ranging from a reported 13 feet at the entrance to 10 feet at the S end. Electricity, gasoline, diesel fuel, water, ice, pumpout station, wet and dry storage, and marine supplies are available. Two 40-ton sling-type launchers are at the harbor.

(395) **Robinson Point,** the easternmost end of Maury Island and the major turning point in the passage, is a low spit projecting 140 yards from the wooded high land. **Robinson Point Light** (47°23'17"N., 122°22'28"W.), 40 feet above the water, is shown from a 38-foot white octagonal tower on the point; a fog signal is at the station.

(396) There are two barge-loading berths at the gravel pits about 1 mile SW of Robinson Point. Conveyors load the barges. The gravel pits are prominent from the S end of East Passage. These facilities are the only commercial wharves on Vashon and Maury Islands, except for oil receiving wharves.

(397) **Redondo,** on **Poverty Bay,** about 6.8 miles SSE of Three Tree Point, is a suburban village. **Dumas Bay,** 2 miles W of Redondo, has a small wharf which bares alongside at low water.

(398) **Quartermaster Harbor** extends 5 miles NNE between the S parts of Vashon and Maury Islands, opposite Commencement Bay. Its shores are low and wooded, with numerous clearings, and several landings and private piers.

(399) Quartermaster Harbor affords excellent anchorage about 2 miles inside the entrance in 5 to 10 fathoms, muddy bottom. The harbor is easy of access, and a midchannel course may be followed with safety.

(400) A shoal just inside the entrance, between **Neill Point** and **Piner Point,** extends 300 yards from the E shore and is marked by a buoy. In an area just N of Neill Point, shoal spots extend 400 yards offshore, covered 2¼ to 2¾ fathoms. Depths of 4¼ fathoms are near midchannel W of **Manzanita,** and also near midchannel W of Dockton.

(401) Many settlements and summer resorts are along the shores of the harbor, but the landing wharves, for the most part, are in disrepair.

(402) **Burton** is a town on **Burton Peninsula** which projects E from the W side about 3 miles from the entrance. It has several stores and a marina. The marina has a pier with floats for a sizable number of pleasure craft; electricity, gasoline, water, and ice are available. A 4-ton hoist at the marina can handle craft to 32 feet for hull, engine or electronic repairs. Some marine supplies are available in the town. The Quartermaster Yacht Club has its moorage just N of the marina. There are numerous private mooring buoys in this part of the harbor.

(403) An oil-receiving wharf and storage tanks are on the W side of the harbor about 0.7 mile N of Burton at the mouth of Judd Creek. The storage tanks are on the hill N of the harbor.

(404) **Dockton,** in the bight on the E side about 2.5 miles from the entrance, is a village with a store. A County Park is on the E side of the bight. The park has a dock with several piers.

(405) In the upper part of the harbor, N of the Burton Peninsula, are several private wharves and floats.

(406) **Colvos Passage,** on the W side of Vashon Island, extends about 11 miles in a general S direction, with an average width of 1 mile. The passage is free of dangers. The N entrance is about 4.5 miles SW of Alki Point, and the S entrance is abreast Point Defiance. The passage is used principally by tugs hauling logs for the sawmills. A midchannel course can be followed with safety. The passage is marked by lights.

(407) The current in Colvos Passage favors a N set, and at times advantage is taken of this fact by vessels bound from Tacoma to Seattle. The current in the middle of Dalco Passage and along the SW shore of Commencement Bay sets W or NW almost continuously.

(408) To obtain full advantage of the peculiar currents in Colvos Passage and connecting waterways, use should be made of the Tidal Current Charts, Puget Sound, Southern Part.

(409) **Point Southworth,** on the W side of the N entrance, is high and wooded. A ferry slip is 0.2 mile NW of the point. An automobile ferry runs to Fauntleroy and Vashon Heights.

(410) **Fragaria** and **Olalla,** on the W shore of Colvos Passage, are small residential communities. Only isolated piling remain of their former wharves. A rock which bares at half tide is 400 yards N of the former wharf at Olalla. Olalla has a small-craft float landing and a general store. Gasoline, water, ice, and some marine supplies are available.

(411) **Cove** and **Lisabeula,** on the E shore, are summer resort areas. There are no facilities at either area. The wharf at Cove is in ruins. Several pilings, formerly used as moorings for log rafts, are adjacent to the wharf. Lisabeula consists of a single waterfront resort with no facilities for small craft.

(412) **Tahlequah** is a small residential community on the S shore of Vashon Island between Neill Point and Point Dalco. A ferry operates between Tahlequah and Tacoma. A marina with a 280-foot pier is just N of the ferry slip. Berths, gasoline, water, and ice are available.

(413) **Gig Harbor** is an inlet about 1 mile long on the W side of the S entrance to Colvos Passage abreast Point Defiance. A private light is on the S end of the sandspit, at the E side of the entrance, which makes out for 220 yards and constricts the entrance to less than 100 yards wide. A narrow 10-foot channel in the middle has currents of considerable velocity. Inside the entrance the basin has from 4 to 6 fathoms. The surrounding land, partially cleared of timber, slopes gently toward the shores and is thickly settled.

(414) The town of **Gig Harbor** extends along the W shore and the head of the harbor. It is the home port of many pleasure craft and fishing boats. The town has a boatyard with three marine railways and one crane. The larger of the three railways can handle craft to 150 tons for hull and engine repairs. There are many private piers and wharves, including one gasoline float. There are many marinas here. Berths, gasoline, diesel fuel, water, ice, launching ramps, and marine supplies are available in the harbor. Most of the pleasure craft moor at one of the marinas at the head of the harbor.

(415) On entering Gig Harbor, hold midway between the spit on the E side and the W shore until just inside the entrance. Then swing right toward the E shore until past the short spit extending from the W shore, and steer a course just S of midchannel into the harbor.

Chart 18453

(416) **Dash Point**, the E entrance of Commencement Bay, and the village of **Dash Point** are 1 mile NE of Browns Point. There is a restaurant at the foot of the long pier which extends out from the N side of the point to a depth of 20 feet.

(417) **Point Defiance,** the W entrance of Commencement Bay, terminates in a very prominent dirt bluff, 160 feet high. A light and fog signal are just W of the point. **Point Defiance Park** is wooded for 1 mile from the end of the point.

(418) **Commencement Bay** entrance lies 18 miles S of Alki Point and 56 miles S of Point Wilson. The bay is about 2.5 miles in length, easy of access, and free of dangers. Log storage grounds are off the NE shore of the bay.

(419) **Tacoma,** the second city in size and importance on the sound, occupies the S and SW shores of Commencement Bay, and its residential area has grown N into Seattle's S suburbs, and to Steilacoom on the SW.

(420) The **Port of Tacoma** is a rapidly expanding major port, second only to Seattle in maritime importance on Puget Sound. Its exports include lumber and other wood products, grain, refined metals, machinery, general and containerized cargo; imports include alumina, and refined steel, automobiles, electronic equipment, rubber, and meat. Much of the Alaska trade originates here.

Prominent features

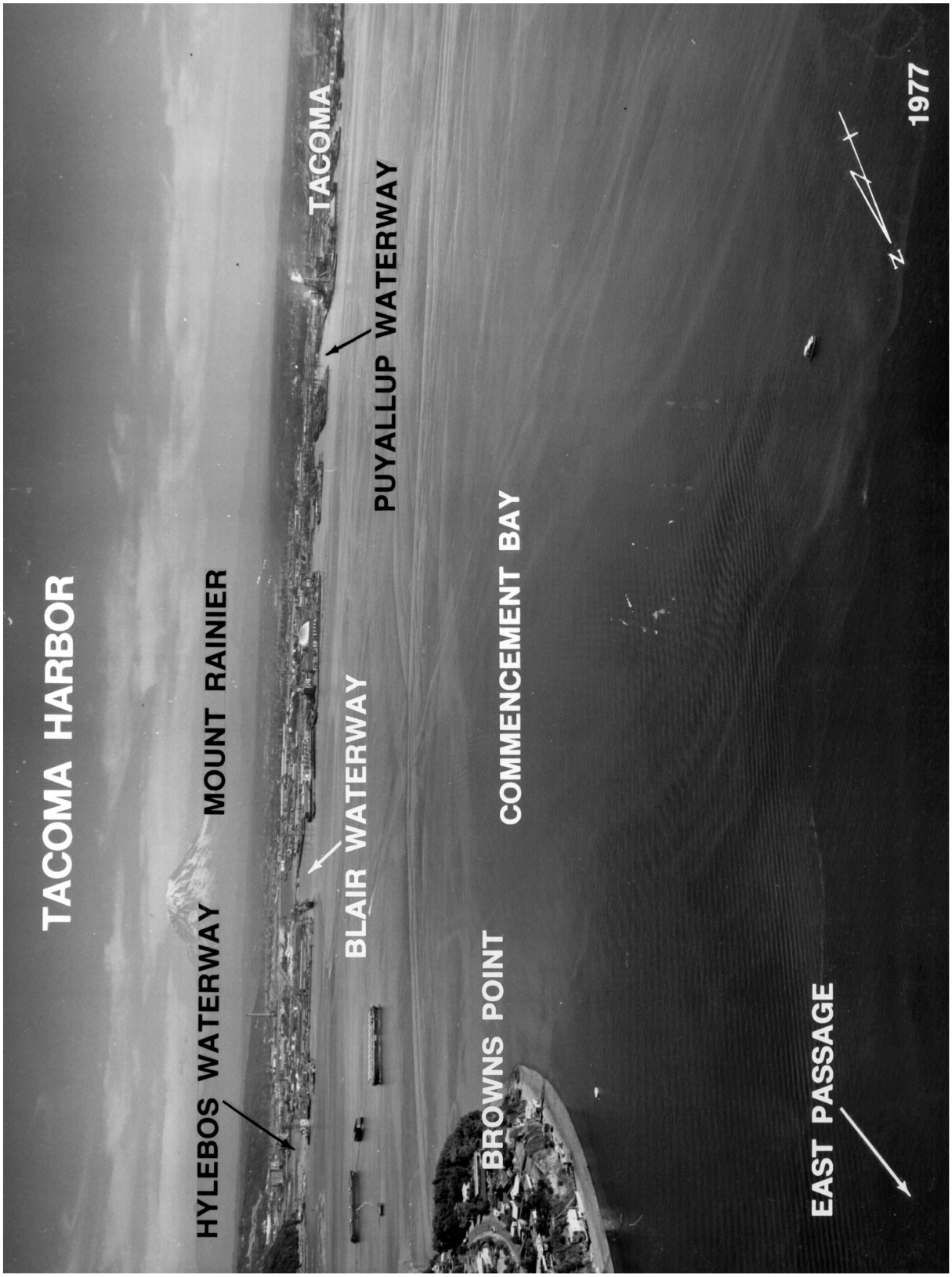
(421) On entering Commencement Bay, either from the N via East Passage or Colvos Passage or from the S via The Narrows and Dalco Passage, Dash Point, Browns Point, and Point Defiance are prominent. **Browns Point Light** (47°18'22"N., 122°26'35"W.), 38 feet above the water, is shown from a 31-foot white tower on Browns Point; a fog signal is at the light. Once inside the bay numerous stacks, tanks and towers are visible.

(422) A fishing reef, marked by private buoys, is along the SW shore of the bay about midway between Ruston and Tacoma. A fish haven, covered 21 feet, is just N of the public pier at the N end of Tacoma.

(423) From the NE corner of Commencement Bay, the city waterfront extends NW to within 1.5 miles of Point Defiance. Along here are numerous industrial plants with wharves to accommodate vessels drawing 30 feet or more.

(424) **Thea Foss Waterway** is the westernmost of the channels at the head of the bay. A light and fog signal are on the E side of the entrance. A Federal project provides for depths of 29 feet in Thea Foss Waterway to the South 11th Street Bridge, thence 22 feet for 0.2 mile, thence 19 feet to the head of the project. Maintenance work is done when required on this waterway. Two deep-draft oil handling wharves and many oil storage tanks are on the E side.

(425) There are two bridges over the waterway. The South 11th Street vertical lift bridge, 0.5 mile from the entrance to the waterway, has a clearance of 64 feet


TACOMA HARBOR
HYLEBOS WATERWAY
MOUNT RAINIER
TACOMA
BLAIR WATERWAY
PUYALLUP WATERWAY
BROWNS POINT
COMMENCEMENT BAY
EAST PASSAGE
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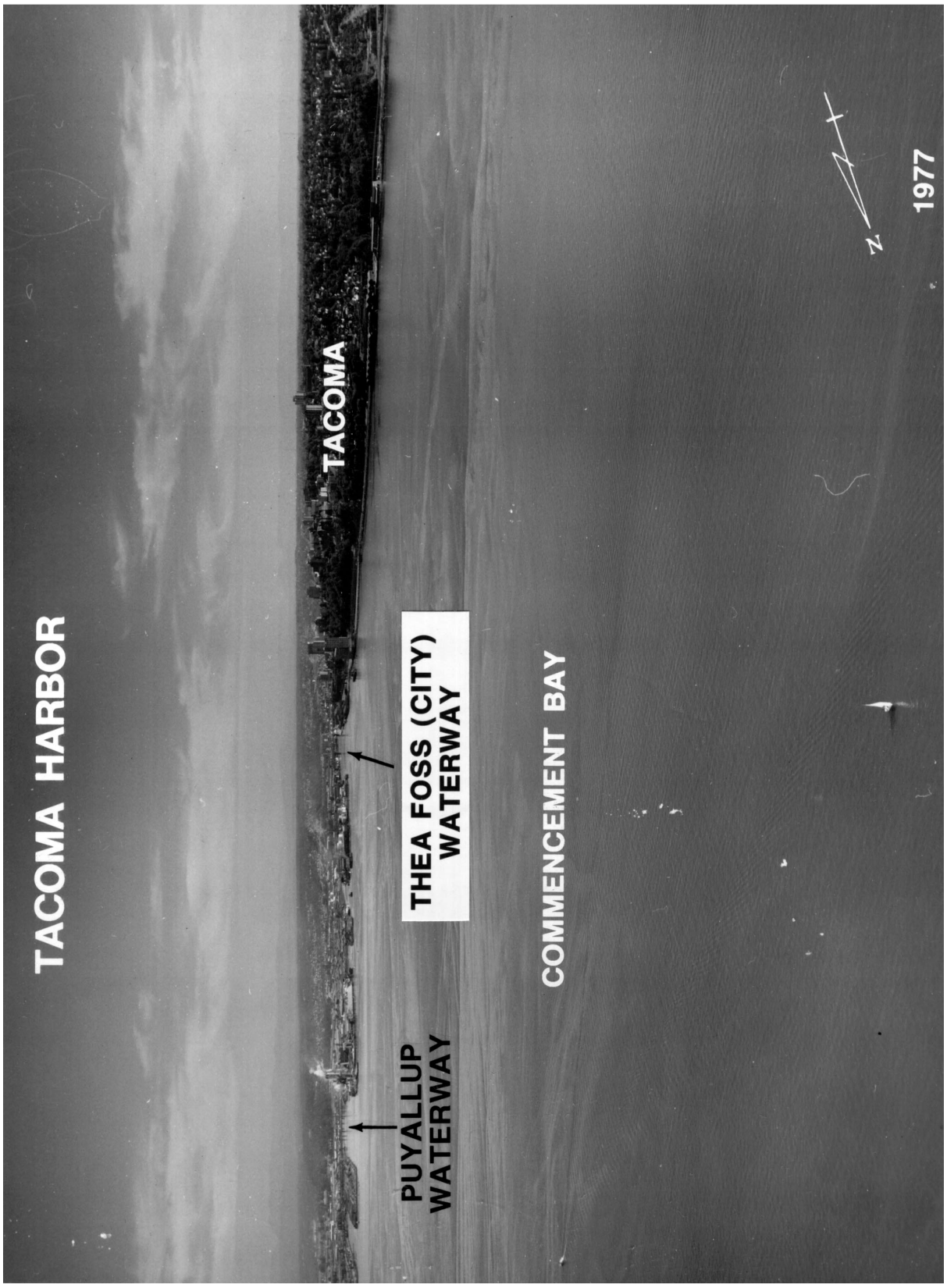
TACOMA HARBOR
TACOMA
PUYALLUP WATERWAY
THEA FOSS (CITY) WATERWAY
COMMENCEMENT BAY
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down and 139 feet up. A fixed highway bridge near the head of the waterway has a clearance of 28 feet (36 feet at the center).

(426) **Middle Waterway,** NE of Thea Foss Waterway, and **St. Paul Waterway,** NE of Middle Waterway, are not Federal projects. The inner parts of both waterways have shoaled and are not navigable. For about the outer 400 yards of each waterway, there are depths of 25 to 34 feet, but there is no deep-draft traffic. St. Paul Waterway is used for log storage by the large papermill which occupies the land on the NE side.

(427) **Puyallup Waterway,** NE of St. Paul Waterway, discharges the water of **Puyallup River.** The waterway has shoaled to such an extent that it cannot be used commercially. A lighted buoy marks a shoal area extending about 500 yards NW of the entrance. A pipeline bridge, 0.8 mile above the mouth, has a clearance of 13 feet. A fixed highway bridge, just below the pipeline bridge, has a clearance of 29 feet.

(428) **Milwaukee Waterway,** NE of Puyallup Waterway, has depths of 25 feet at the entrance and 30 feet or more inside, but is not a Federal project.

(429) **Sitcum Waterway,** NE of Milwaukee Waterway, has depths of 37.2 to 43.1 feet; it is not a Federal project. The Port of Tacoma's Pier 7 is on the E side. A private light is just off the NW end of Pier 7; it marks the NE side of the entrance to Sitcum Waterway.

(430) The next two channels to the NE of Sitcum Waterway, **Blair Waterway** and **Hylebos Waterway,** are maintained as Federal projects. A lighted buoy is off a shoal on the N side of the entrance and a private light is on the S side at the NW end of Pier 25; these aids mark the entrance to Hylebos Waterway. The entrance to Blair Waterway is marked by a directional light on the NE side and a private lighted buoy on the SW side. Project depths in Hylebos Waterway are 30 feet in the waterway and basins. Project depths in Blair Waterway are 30 feet in the Southern Section and 35 feet in the rest of the waterway and basins. (See Notice to Mariners and latest editions of charts for controlling depths.)

(431) The 11th Street bascule bridge over Hylebos Waterway has a clearance of 21 feet. (See **117.1 through 117.59 and 117.1061,** chapter 2, for drawbridge regulations.) The bridgetender monitors VHF-FM channel 16 and works on channel 13. Call signs: KZN-574, Hylebos Bridge. A power cable at the bridge has a clearance of 173 feet.

Anchorage

(432) A **general anchorage** is off the N shore of Commencement Bay. (See **110.1 and 110.230,** chapter 2, for limits and regulations.) The depths elsewhere in the bay, as a rule, are too great for convenient anchorage.

(433) City regulations permit anchorage in any part of the bay outside the harbor lines so as not to interfere with vessels arriving or departing from their docks.

Tides and currents

(434) The mean range of tide at Tacoma is 8.1 feet, and the diurnal range of tide is 11.8 feet. A range of about 19 feet may occur at the time of maximum tides. The tidal currents in the harbor have little velocity, except in Hylebos Waterway where the NOAA Ship **McARTHUR** reported estimated currents of up to 2 knots in 1994.

Pilotage, Tacoma

(435) Pilotage is compulsory for all vessels except those under enrollment or engaged exclusively in the coasting trade on the W coast of the continental United States (including Alaska) and/or British Columbia. Pilotage for Puget Sound is provided by the Puget Sound Pilots. (See Pilotage, Strait of Juan de Fuca and Puget Sound, indexed as such, chapter 12 for details.)

Towage

(436) Tugs up to 3,000 hp are available at Tacoma, and larger tugs may be obtained from Seattle. Arrangements should be made in advance through ships' agents.

Quarantine, customs, immigration, and agricultural quarantine

(437) (See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

(438) **Quarantine** is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

(439) Tacoma is a **customs port of entry.**

Harbor regulation

(440) Harbor regulations are administered by the **harbormaster,** whose headquarters are at the fire station at 901 South Fawcett Street. The general offices of the Port of Tacoma are in the Tacoma Building at the corner of 11th and A Streets; the Port of Tacoma terminal offices are at Pier 2.

Speed

(441) A city ordinance prohibits speeds in excess of 5 knots on any of the waterways and within 200 yards of any shore or pier in the harbor.

Wharves

(442) The Port of Tacoma has more than 30 deep-draft piers and wharves located on Hylebos, Blair, Sitcum, and Thea Foss Waterways and along the S shore of Commencement Bay. The port-owned properties

consist of the Port Industrial Yard, the 160-acre area between Blair and Hylebos Waterways NW of 11th Street, and its deep-draft piers; the 3,600-acre Port Industrial Development District, which includes the entire waterfronts of Blair and Hylebos Waterways above 11th Street; and the Marine Terminal facilities between Blair and Sitcum Waterways below 11th Street. The terminal facilities include some 23 deepwater berths ranging in depth from 35 to 65 feet. In addition to the port-owned properties, the harbor has numerous privately owned piers and wharves and many barge facilities.

(443) Only the major deep-draft facilities are described. For a complete description of the port facilities refer to Port Series No. 35, published and sold by the U.S. Army Corps of Engineers. (See appendix for address.) The alongside depths are reported. (For information on the latest depths contact the Port of Tacoma general office or the individual operators.) All the facilities described have direct highway connections, and most have plant trackage with railroad connections. Water and electrical shore power connections are available at about 80 percent of the wharves. General cargo is usually handled by ships' tackle. Special handling equipment, if available, is mentioned in the description of the particular facility. The Port of Tacoma operates its own belt line railroad with switching connections to two major railroads and has a 200-ton mobile crane and a 300-ton floating crane.

Port of Tacoma facilities:

Facilities on Blair Waterway:

(444) **Terminal 4** (47°16'22"N., 122°24'18"W.): W side of Blair Waterway just below East 11th Street, 1,900-foot berthing space, 50 feet alongside; deck height, 18 feet; 75 acres open storage; six 50 to 66-ton straight-line cranes; rail service with 10-car capacity; receipt and shipment of general and containerized cargo; operated by the Port of Tacoma.

(445) **Blair Waterway Log Terminal**: W side of Blair Waterway, 1.8 miles above the entrance to the waterway; 1,200-foot berthing space, 50 feet alongside; deck height, 22 feet; 10 acres open log storage and sorting area; lift equipment required, receipt and shipment of fabricated structure; operated by Port of Tacoma.

(446) **Pierce County Terminal**: S end of the upper turning basin on Blair Waterway; 1,400-foot berthing space, 50 feet alongside; deck height, 22 feet; one 60-ton traveling gantry crane; 100,000 square feet covered storage, 147 acres paved, open storage area; receipt and shipment of general cargo; receipt of automobiles, lumber, military equipment, and heavy lift items; rail spurs on pier, adjacent the warehouse and in auto storage areas; operated by Port of Tacoma.

(447) **Weyerhaeuser Wood Chip Terminal** (47°15'42"N., 122°23'01"W.): 805 feet of berthing space with dolphins; 50 feet alongside; deck height, 20 feet; belt-conveyor with loading rate of 1,000 tons per hour; 25 acres of open storage for 100,000 tons with rail access, 32-car capacity storage/siding; shipment of wood chips; operated by Weyerhaeuser Co.

(448) **Georgia-Pacific Gypsum Terminal** (47°16'02"N., 122°23'29"W.): 220-foot face; 580 feet of berthing space with dolphins; 50 feet alongside; deck height, 18 feet; belt conveyor with unloading rate of 2,000 tons per hour; covered storage for 40,000 tons of gypsum rock; receipt of gypsum rock by self-unloading vessels; operated by Georgia-Pacific Gypsum.

(449) **Totem Ocean Trailer Express (TOTE) Terminal** (47°16'29"N., 122°24'14"W.): 620-foot face; two dolphin piers, 620-foot face and 1,000 foot-face; 50 feet alongside; 33 acres open storage; receipt and shipment of roll-on/roll-off cargo; operated by Totem Ocean Trailer Express (TOTE).

Facilities on Sitcum Waterway:

(450) **Terminal 7** (47°16'06"N., 122°24'48"W.): 2,700-foot berthing space; 39 feet alongside two inner berths, A and B, 45 feet alongside Berth C and 50 feet alongside outer berth, Berth D; deck heights, 18 feet; 198,400 square feet covered storage; three 40-ton traveling gantry cranes, one bulk-loading crane, rate 750 tons per hour, container cranes to 60 tons, alumina loadout facility which transports alumina ore to one of two storage domes, capacities of 50,000 and 100,000 tons, serves Berth C; receipt of alumina, receipt and shipment of general, roll-on/roll-off, and containerized cargo; operated by Port of Tacoma, Kaiser Aluminum & Chemical Corp.

Facilities on SW side of Commencement Bay:

(451) **Continental Grain Wharf** (47°15'59"N., 122°26'35"W.): 910 feet of berthing space with dolphins; 65 feet alongside; deck height, 19½ feet; 3-million-bushel grain elevator; loading rate, 80,000 bushels per hour; shipment of grain; operated by Continental Grain Co.

Private facilities:

Facilities on Hylebos Waterway:

(452) **Occidental Chemical Corp., Docks 1 and 2** (47°16'49"N., 122°24'08"W.): 940-foot usable berthing space with dolphins, 32 feet alongside; deck heights, 19 feet; pipelines extend from wharves to storage tanks; at wharf 1, a hopper for receiving bulk salt serves a

conveyor system extending to storage area of 70,000-ton capacity, unloading rate 900 tons per hour; storage tanks for 37,000 barrels of fuel oil and 4 million gallons of caustic soda; receipt of fuel oil for plant consumption and bulk salt; shipment of industrial chemical and caustic soda; receipt and shipment of liquid caustic soda, chlorine, and brine solutions; owned and operated by Occidental Chemical Corp.

(453) **PRI Northwest Wharf**: W side 500 yards NW of 11th Street Bridge; 500 feet of berthing space with dolphins, including adjacent U.S. Naval Reserve Wharf; 30 to 31 feet alongside; deck heights, 12 to 18 feet; storage tanks with a 80,000-barrel capacity; receipt and shipment of petroleum products; owned and operated by PRI Northwest Inc.

(454) **Sound Refining Dock** (47°16'33"N., 122°23'03"W.): 770 feet of berthing space with dolphins; 30 feet alongside; deck height, 19 feet; storage tanks with a 600,000-barrel capacity; receipt and shipment of petroleum products; owned and operated by Sound Refining Inc.

(455) **Pennwalt Corp. Wharf** (47°16'09"N., 122°22'24"W.): 740 feet of berthing space with dolphins, 30 feet alongside, deck height, 18 feet; conveyors extend from wharf to a 60,000-ton open storage area, storage tanks for 2.2 million gallons of caustic soda and 27,000 barrels of fuel oil; receipt of salt, bulk chemicals, and fuel oil for plant consumption, and shipment of caustic soda and liquid chemicals; owned and operated by Pennwalt Corp.

(456) **General Metals Wharf** (47°16'05"N., 122°22'09"W.): 1,155-foot berthing space with dolphins, 15 to 30 feet alongside, two 40-ton and one 50-ton gantry crane; shipment of scrap metal; owned and operated by General Metals of Tacoma Inc. Note: the company prefers vessels to moor starboardside-to.

(457) **Weyerhaeuser Co., Tacoma Export Yard Dock**: SW side of upper turning basin on Hylebos Waterway; 1,100-foot berthing space with dolphins, 39 feet alongside deck height, 19 feet; 18 acres open log storage and sorting yard; lift trucks to 60 tons; shipment of logs; owned and operated by Weyerhaeuser Co.

Facilities on Blair Waterway:

(458) **U.S. Oil and Refining Co. Dock 1** (47°16'01"N., 122°23'47"W.): 645-foot berthing space with dolphins, 27 to 40 feet alongside, deck height, 18 feet; storage tanks with a 2.1-million-barrel capacity; receipt and shipment of petroleum products; owned and operated by U.S. Oil and Refining Co.

(459) **Tacoma Lime Wharf** (47°16'09"N., 122°23'40"W.): 16-foot face; 420 feet of berthing space with dolphins; 32 feet alongside; deck height, 20 feet; belt conveyor with unloading rate of 300 tons per hour; storage silos for 1,900 tons; open storage for 15,000 tons; receipt of limestone; owned and operated by Tacoma Lime, a division of Continental Lime.

(460) **Buckeye Pipeline Co. Dock** (47°15'30"N., 122°22'52"W.): 200 feet of berthing space with dolphins; 35 feet alongside; deck height, 16 feet; storage tanks with a 90,000-barrel capacity; receipt of jet fuel; owned and operated by Buckeye Pipeline Co.

(461) **Superior Oil Terminals Co. Wharf** (47°15'39"N., 122°26'05"W.): 570-foot berthing space with dolphins, 26 feet alongside, deck height, 20 feet; storage tanks with a 350,000-barrel capacity; receipt and shipment of petroleum products, and fueling of small craft; owned and operated by Superior Oil Terminals Co.

(462) **Tacoma Marine Terminal Dock** (47°15'30"N., 122°25'57"W.): 300 feet of berthing space with dolphins; 30 feet alongside; deck height, 26 feet; storage tanks with a 140,000-barrel capacity; receipt of petroleum products; owned and operated by Union Oil Co. of California.

Supplies

(463) Most marine supplies and services are available at Tacoma. Bunker fuel, diesel oil, and lubricants are available. Gasoline and diesel fuel are available at the oil docks on Thea Foss Waterway. Large vessels are bunkered at their berths by barge. Water is available at most of the berths.

Repairs

(464) There are no facilities for major repairs to large oceangoing vessels in Tacoma; the nearest such facilities are in Seattle, Wash. The largest floating drydock in Tacoma is at a boatbuilding company on the SW side at the entrance to Hylebos Waterway. It will handle vessels to 8,000 tons or 516 feet. The firm has a complete machine shop. The largest marine railway in Tacoma is at a repair yard on the NE side of the upper turning basin in Hylebos Waterway; the railway here is certified for 1,000 tons.

Small-craft facilities

(465) A public pier, owned by the city of Tacoma, is 0.6 mile SE of the S marker of the measured mile course on the SW side of Commencement Bay; small craft moor here temporarily. There are numerous other small-craft facilities on Hylebos, Blair, and Thea Foss Waterways, and on the NE and SW shores of Commencement Bay. (See the small-craft facilities tabulation on chart 18445 for services and supplies available.)

Communications

(466) Tacoma is served by two major railroads, Seattle-Tacoma Airport, and Tacoma Narrows Industrial Airport.

Chart 18448

(467) S of Point Defiance are numerous inlets, passages, and islands. At many of the towns the landing wharves have fallen into ruins, all transportation following the highways. These waters are navigated by log tows and by pleasure craft. Deep-draft vessels call at Olympia for lumber and other forest products. The depths are generally great, and the dangers are few. The shores are well wooded and moderately low. The beaches are sand and gravel, with boulders in places, and are often backed by steep, bare sand and gravel bluffs. Olympia and Shelton are the only cities, but there are many towns. Strangers bound through these waters at night are advised to take a pilot.

Currents

(468) In The Narrows current velocities exceed 5 knots at times. At the N end of The Narrows the current sets N most of the time on the E side of the passage and S most of the time on the W side. (See Tidal Current Tables for daily current predictions for a midstream position near the N end of The Narrows and details of the current movement at other locations; these tables and the Tidal Current Charts, Puget Sound, Southern Part, should both be consulted for details of the complicated currents of this area.)

(469) From Point Defiance to near Days Island, the E shore of **The Narrows** consists of high, bold bluffs. A tunnel is 1.7 miles SE of Point Defiance; from it a railroad track follows the shoreline to Nisqually River.

(470) **Point Evans,** 2 miles S of Point Defiance on the W side of The Narrows, is marked by a light. Power cables with a clearance of 200 feet cross 200 yards S of the point. **Tacoma Narrows Bridge,** a highway suspension bridge, crosses The Narrows a mile S of Point Evans. The clearance is 159 feet at the piers and 180 feet at the center. A private fog signal marks each of the two piers. In April 2003, a fixed bridge was under construction just S of the existing bridge with a design clearance of 180 feet at the center.

(471) **Days Island** is about 4.5 miles S of Point Defiance. The ferry slip and wharf here are in ruins. There are three marinas here, one on the E side of Days Island and two in the cove 150 yards E of the N end of the island. A total of about 200 berths are at the marinas; electricity, gasoline, diesel fuel, water, ice, dry storage for over 500 craft, and marine supplies are available. A 15-ton crane and hoists to 3 tons are available to handle craft for hull and engine repairs. A 2¾-fathom shoal is 230 yards W of the former ferry slip.

(472) A small-boat channel, 1 foot deep, leads into **Days Island Lagoon.** The channel favors the Days Island side and under the bridge is 30 yards from the island shore. Local boats anchor in 3 feet in the lagoon. The floats of a private yacht club are on the S and W sides of the lagoon. Anchorage for small-craft may be had E of the N end of Days Island.

(473) Three miles S of Days Island, the shores consist of bare bluffs which are prominent from S.

(474) From here the route to Olympia continues SW and W through **Balch Passage,** Drayton Passage, and Dana Passage, thence S into Budd Inlet. This route is deep and generally free of dangers.

(475) **Caution.–**The channel through Balch Passage is only about 100 yards wide between the 10-fathom curves, and the scale of the chart is small. Vessels should stay carefully in midchannel, traffic permitting.

(476) **Hale Passage,** between **Fox Island** and the mainland, enters on the W shore 5 miles S of Point Defiance. It is 4 miles to its junction with Carr Inlet. Near the W end the passage is crossed by a fixed highway bridge with a clearance of 31 feet. A shoal, marked on its NE side by a buoy, is 350 yards SE of the bridge and near the middle of the passage; the shoal is boulder-strewn and bares. The channel is on the NE side of the buoy. A good small-craft anchorage is on either side of Tanglewood Island. The current in Hale Passage attains a velocity in excess of 3 knots at times. The E (ebb) current is stronger than the W (flood) current. (See Tidal Current Tables for current predictions.)

(477) **Fox Island** is a village in the small cove near the NE end of Fox Island. It has a store and service station. **Tanglewood Island,** in the center of the cove, has a boys' camp, the buildings of which are prominent. A structure resembling a lighthouse is on the extreme N end of the island.

(478) **Wollochet Bay** is a small inlet about 2 miles long extending N from Hale Passage, about 1 mile inside the E entrance. The upper part is narrow and shoal. It affords an anchorage in midchannel about 0.3 mile inside the entrance in 11 to 12 fathoms, sticky bottom. There are many private piers and mooring buoys in the bay. A small-boat launching ramp is on the E side of the bay near the entrance.

(479) **Gibson Point,** the S tip of Fox Island and the N entrance point of Carr Inlet, is marked by a light. **Toliva Shoal,** nearly in midchannel 0.9 mile S of Gibson Point, consists of two rocks covered 1¾ fathoms and is marked by a lighted bell buoy. An unmarked fish haven extends about 0.25 mile N from the shoal.

(480) **Carr Inlet** enters the W shore of the sound about 7½ miles SSW of Point Defiance. From the entrance, between Fox and McNeil Islands, it extends about 6 miles NW and then trends NNE for 8 miles terminating in flats at the head. Good anchorage is available in the upper reaches in 6 to 15 fathoms, soft bottom, and in several small coves on its S and E shores. From the entrance, a midchannel course is safe.

(481) A **naval restricted area** is in the S part of Carr Inlet. (See **334.1250**, chapter 2, for limits and regulations.)

(482) A **298°23'-118°23' measured nautical mile** has been established on the NE shore of McNeil Island. Range markers, consisting of white diamond daymarks with red vertical stripes, mark the ends of the measured course.

(483) The Washington State penitentiary, on the SE side of **McNeil Island** about 0.8 mile SW of **Hyde Point,** is prominent from offshore. Vessel traffic is restricted within 100 yards of McNeil Island, which is prison property.

(484) **Wyckoff Shoal,** part of which bares, extends 0.8 mile NW from the NW part of McNeil Island. Buoys on the W side of the shoal mark the E side of the channel leading into Pitt Passage.

(485) **Pitt Passage,** between Key Peninsula and McNeil Island, connects Drayton Passage and Carr Inlet. It is obstructed about midway of its length by **Pitt Island** and its surrounding rocks and shoals. Only the passage E of Pitt Island is used by small craft with local knowledge. In this passage the ebb (N current) is stronger than the flood and attains a velocity of 2.5 knots or more at times.

(486) **Lakebay,** at the head of **Mayo Cove** on the SW shore of Carr Inlet, is a village with a store and several small private piers. A marina here has a long pier and floats with berthage for about 35 craft; electricity, gasoline, water, and ice are available. About 7 feet can be carried to the marina pier, but the channel to the pier is difficult to navigate; strangers are advised to proceed cautiously and obtain local advice. On the E side of Mayo Cove, along **Penrose Point,** a State park has a small float with moorage for about 10 small craft. Water and a pump-out station are available at the State park.

(487) **Home,** a village on the W side of **Von Geldern Cove,** has a store and service station. A bridge crosses the cove at its head. A shoal extends from the N shore at the entrance to the cove.

(488) **Glencove** is a small settlement in Glen Cove on the W side of Carr Inlet, about 5 miles N of South Head. It is a summer recreational area with a private wharf and float. A small marina here has berths and gasoline.

(489) **Wauna** is a village at the head of Carr Inlet, where the spit enclosing **Burley Lagoon** joins the mainland. A county road extends along the spit and across the entrance to the lagoon over a fixed highway bridge to Rosedale and Gig Harbor. The bridge has a clearance of 12 feet (23 feet at center). A boat launching ramp is at Wauna just W of the bridge.

(490) **Rosedale** is a residential community on the cove on the E side of Carr Inlet and 180-foot-high **Raft Island.** There is an extensive shoal area around and between Raft Island and **Cutts Island.** Cutts Island is part of a state park. The shores of these islands are strewn with boulders. A fixed highway bridge and overhead cable extend from the S side of Raft Island to the mainland. The bridge clearance is 17 feet, and the cable, 48 feet.

(491) **Horsehead Bay,** about 1 mile long, is directly N of Green Point, at the W extremity of Hale Passage. This is a residential area with several private wharves.

(492) **Eagle Island,** small and wooded, is near the middle of Balch Passage, 0.2 mile from **Anderson Island**, and is marked on its N end by a light. Eagle Island is a State park.

(493) **Eagle Island Reef,** 300 yards W of Eagle Island, bares 1 foot at its S part and has a depth of 3 feet at its N part. A lighted buoy is off the NW part of the reef.

(494) **Drayton Passage,** between Key Peninsula and Anderson Island, is about 3 miles long in a N direction; at its N end, it connects with Pitt Passage and Balch Passage, and at its S end joins the W part of Nisqually Reach. With the exception of a spit extending 0.2 mile from the W shore, marked by a light, the waters are deep and free of dangers. A small-boat launching ramp is 0.25 mile N of the light. Estimated current velocities of 1 to 2 knots occur at the SW end of the passage.

(495) **Filucy Bay,** on the W shore opposite Balch Passage, is about 1.5 miles long and irregular in shape; it is 0.4 mile wide at the entrance. Good anchorage in 7 to 8 fathoms, muddy bottom, is available. There are numerous houses around the shores of this bay. **Longbranch,** a village in the small cove opposite the entrance, has a pier and floats for about 30 fishing and pleasure craft.

(496) **Steilacoom** is on the mainland about 9 miles SSW of Point Defiance. The town is of little commercial importance and has no waterfront facilities except for the ferry terminal which maintains service to Anderson and Ketron. Limited berthage for small craft, gasoline, water, ice, and a hoist are available at the terminal. Limited engine repairs can be made. Indifferent anchorage may be had along the waterfront close inshore, but it is not recommended as the holding ground is poor and the currents have considerable velocity. Off Steilacoom there are tide rips which, with a wind opposing the current, are dangerous to small boats.

(497) There are two large, conspicuous sand and gravel pits on the bluffs about 1.5 miles NNE of Steilacoom. Both have T-piers served by conveyor belts from the gravel pits. The N pier is 520 feet long, has 20 to 30 feet

reported alongside, and has a deck height of 14 feet. The S pier is 200 feet long, and has 25 to 30 feet reported alongside and a deck height of 20 feet. Both are used for the shipment of sand and gravel.

(498) **Ketron Island,** 10 miles SSW of Point Defiance and E of Anderson Island, is a small, narrow island which is privately owned. It is heavily wooded with bluff shores. **Cormorant Passage,**0.5 mile wide, separates the island from the mainland S. The passage is clear, but is little used.

(499) **Nisqually Reach** trends S and W around Anderson Island. The S shore is occupied for nearly 1 mile offshore by **Nisqually Flats,** the delta formed by the **Nisqually River.** The flats are very soft mud and bare at low water. A major portion is designated a National Wildlife Refuge, the boundaries are marked by signs. A section is also used for commercial aquaculture. A boat ramp at Nisqually Head is accessible only at high water. Two lighted buoys mark the steep N edge of the flats. A light marks the S tip of Anderson Island at Lyle Point. **Thompson Cove** on the W side of the point is a cable area and should not be used as an anchorage. An artificial reef is at the State park 2.7 miles W of Nisqually Head. The reef is marked by private buoys.

(500) **Oro Bay,** in the SE part of Anderson Island, is an irregular bight between **Cole Point** and **Lyle Point.** Most of the bay is shallow; it affords an indifferent anchorage in about 10 fathoms, but is affected by the currents and affords little protection. A small shallow arm extends about 1 mile NW on the W side of the bay and is marked by private buoys. An anchorage for small craft is here.

(501) A wharf, built out from the mouth of **Sequalitchew Creek,** 13 miles SSW of Point Defiance, is 340 feet long, has 27 feet reported alongside, and a deck height of 19 feet.

(502) **Devils Head,** the S point of Key Peninsula, is 280 feet high and heavily wooded. A light is shown off the S tip of Devils Head.

(503) **Johnson Point,** 2 miles W of Devils Head, is 90 feet high. A light is on the sandspit at the end of the point.

(504) There are two marinas on the W shore of Nisqually Reach, one 0.8 mile and one 1.9 miles SSE of Johnson Point. Gasoline, water, ice, some marine supplies, and a launching ramp are available at each marina. The N marina has diesel fuel and a 5-ton hoist. The S marina has a 25-ton lift that can handle craft up to 20 feet long. Both marinas can make hull and engine repairs. Depths of 8 feet are off the floats at the N marina, but those at the S marina go dry at low tide.

Local magnetic disturbance

(505) Differences of as much as 3° from normal variation have been observed along Henderson Inlet.

(506) **Itsami Ledge,** covered 1 fathom, lies 1 mile WSW of Johnson Point. It is surrounded by kelp and marked by a light. This is a danger in entering Henderson Inlet or Dana Passage. A fish haven, marked by a private buoy, is close N of the light.

(507) **Henderson Inlet,** locally known as **South Bay,** immediately W of Johnson Point, extends about 4.5 miles in a S direction; the S part is an extensive flat. Good anchorage is inside the entrance in 5 to 6 fathoms, muddy bottom. A spit makes out about 0.2 mile N from the W point at the entrance; on the W shore, 0.8 mile S of the entrance point, is a long sandspit. Oyster beds abound in the S area of the bay.

(508) **Case Inlet,** a popular sport fishing and resort area, extends some 14 miles N from Johnson Point. The flats at its head are only 2 miles from the head of Hood Canal. Depths are irregular, from 10 to 30 fathoms, but there are no off-lying dangers.

(509) **Harstine Island** forms the W side of the S part of the inlet.

(510) A facility in Whiteman Cove, on the E side of the inlet about 3.7 miles N of Devils Head, has berthing, water, and a launching ramp.

(511) A marina in Jarrell Cove at the N end of the island has berths, electricity, gasoline, diesel fuel, water, ice, and some groceries. The pier here has 10 feet reported alongside. The 200-foot Jarrell Cove State Park pier is directly across the cove from the marina. A State park float, with a pump-out station, is farther up the cove.

(512) **Herron Island,** about 4 miles N of the entrance and 0.3 mile W of the E side, is a private island, with moorings for small craft. A ferry connects with the mainland at the village of **Herron.** The bar between the N end of Herron Island and the E shore has a least depth of about 13 feet, but with local knowledge a depth of 21 feet can be carried through by rounding the NE tip of Herron Island some 300 to 500 yards off.

(513) **McMicken Island,** 1.1 miles SW of Herron Island, is connected to Harstine Island by a sandpit which bares at low water. Anchorage with a rocky bottom and protection from S winds is on the NW side of the island.

(514) **Pickering Passage** indents the W shore of Case Inlet, about 2 miles N of Herron Island. The passage extends in a general S direction for 8 miles, connecting at its S end with Peale Passage and Totten Inlet. The shores are generally low and wooded, and the depths vary from 4½ to 15 fathoms. Except for the shoals extending E from the mouth of Hammersley Inlet, the passage is free of outlying dangers, and a midchannel course is safe. In Pickering Passage the flood current sets from Case Inlet toward Hammersley Inlet and the ebb in the opposite direction. The strongest currents are near the S end where velocities reach 2.5 knots at times. The settlements are served by highway. A fixed

highway bridge with a clearance of 31 feet crosses the passage from Graham Point to Harstine Island, about 2.6 miles N of the entrance to Hammersley Inlet.

(515) **Stretch Island** is near the W shore of Case Inlet, just N of the entrance to Pickering Passage. There is no through channel W of this island. The N part of this island is partly cleared of trees and laid out in orchards; a winery and several grape juice factories, no longer operating, are here. There is a private landing wharf built out to 12 feet on the N end of the island. A fixed highway bridge with a clearance of 14 feet connects the mainland. **Grapeview** is a village opposite Stretch Island.

(516) **Reach Island,** 0.2 mile N of Stretch Island, has been subdivided for homesites and is known as **Treasure Island.** It is separated from the W shore by a shallow channel known locally as **Fair Harbor.** The channel is spanned by a fixed bridge with a clearance of 16 feet. There is a marina on the mainland 0.3 mile S of the bridge with about 70 berths, electricity, gasoline, water, ice, nautical supplies, hull and engine repair, and a launching ramp. Approaches to the marina are recommended from the S. The remainder of the channel has reported depths of 2 feet when favoring the W shore. Caution is advised when navigating more than 150 feet N of the marina.

(517) **Vaughn** is a village on the N shore of **Vaughn Bay,** which lies on the E side of Case Inlet about 4 miles from the head. There is a public launching ramp here. The combined civic center for all the small towns on the entire peninsula is at Vaughn. A channel 1½ feet deep leads to deeper water in the bay. Follow the N shore for 200 yards after entering in midchannel off the end of the spit; then cross the bay parallel with the spit at a distance of 200 yards, heading toward the S shore; then follow the S shore at a distance of 200 yards, steering toward the head of the bay. Around the shores are numerous houses and orchards, and a little-used log booming area.

(518) **Rocky Bay** is the shallow inlet N of Vaughn Bay. A channel 3 feet deep leads to the lagoon back of the sandspit near **Windy Bluff.** It is necessary to come around the small sand island N of the spit. Oysterbeds are in the E side of the bay N of the spit.

(519) **Allyn** is a village on the W side of Case Inlet near the head about 0.5 mile N of **Sherwood Creek.** A public pier and launching ramp are here. An oyster wharf is just N of Allyn.

(520) Good anchorage may be had anywhere N of Harstine Island, in 6 to 15 fathoms, muddy bottom.

(521) There are numerous farms and several small settlements whose chief industries are oyster culture, farming, and some logging. The flats near the head of the inlet are largely covered with oysterbeds.

(522) **Peale Passage,** about 4 miles long, extends NW between Harstine and Squaxin Islands, and connects with Pickering Passage. It has a controlling depth of about 10 feet. Strangers should not attempt it. The current at times attains a velocity of 2.0 knots in the narrow part of the passage, and sets N on the flood.

Chart 18456

(523) **Dana Passage**, between **Brisco Point,** the S point of Harstine Island, and the mainland, is about 2 miles long. It is the main route to Budd Inlet and Olympia, and also joins with three other bodies of water: Eld Inlet, Squaxin Passage, and Peale Passage. Squaxin Passage leads to Totten and Hammersley Inlets, and Peale Passage leads to Pickering Passage.

(524) With the exception of Itsami Ledge near its E end and a fish haven about 0.3 mile N of Itsami Ledge Light 7, Dana Passage is clear and a midchannel course may be safely followed. The currents in Dana Passage frequently attain velocities of 3 knots or more.

(525) **Boston Harbor,** a village in the cove of the same name just E of Dofflemyer Point, has a marina with berthage for about 100 craft, gasoline, diesel fuel, water, ice, limited supplies, and a launching ramp.

(526) **Budd Inlet,** 29 miles by water from Tacoma, is about 6 miles long, extending S from Dana Passage and terminating in flats that bare at the head of **East Bay** and **West Bay**. The entrance is between Cooper Point and **Dofflemyer Point;** the latter is marked by a light and fog signal. The entrance to Budd Inlet is deep except for the 28-foot shoal in the middle of the entrance. The shores are comparatively low and wooded, and the depths shoal less abruptly on the E than on the W side of the inlet. East Bay and West Bay are obstructed by flats and shoals that bare for about 0.8 mile, through which channels have been dredged to the Olympia waterfront.

(527) **Olympia,** the capital of the State of Washington, is a lumber port at the head of East and West bays at the S end of Budd Inlet. Over 90 percent of the waterborne traffic of the port concerns lumber and logs.

Prominent features

(528) The capital dome and the radio tower on the N end of the port fill area are prominent landmarks from outside the entrance channel.

Channels

(529) A Federal project provides for a 30-foot channel from deepwater in Budd Inlet to a 30-foot turning basin off the W side of the port terminal near the head of West

Bay. The channel is marked by a daybeacon, lights, buoys, and lighted ranges.

(530) A dredged channel with a project depth of 13 feet leads SE from the 30-foot outer channel to a mooring basin on the E side of the peninsula at the head of East Bay. The channel is marked by a daybeacon and lights. (See Notice to Mariners and latest editions of charts for controlling depths.)

Anchorage

(531) Good anchorage may be had anywhere inside the entrance in muddy bottom.

Dangers

(532) **Olympia Shoal**, which bares, is about 0.4 mile off the W shore, 3 miles inside the entrance. A light is on the E side of the shoal, and on its W side are lights marking the approach to the dredged channel. There are numerous shoals, piles, dolphins, and log booms on the E side of the harbor.

(533) SE of Olympia Shoal is a **177°15'-357°15' measured course,** 6,201 feet long. Olympia Shoal Light and Olympia Channel Light are the markers.

Tides

(534) The mean range of the tide at Olympia is 10.5 feet, and the diurnal range of tide is 14.4 feet.

Pilotage, Olympia

(535) Pilotage is compulsory for all vessels except those under enrollment or engaged exclusively in the coasting trade on the W coast of the continental United States (including Alaska) and/or British Columbia. Pilotage for Puget Sound is provided by the Puget Sound Pilots. (See Pilotage, Strait of Juan de Fuca and Puget Sound, indexed as such, chapter 12 for detail.)

Towage

(536) Tugs to 3,000 hp are available from Tacoma and to 5,000 hp from Seattle. No large tugs are stationed in Olympia.

Quarantine, customs, immigration, and agricultural quarantine

(537) (See chapter 3, Vessel Arrival Inspections, and appendix for addresses.)

(538) **Quarantine** is enforced in accordance with regulations of the U.S. Public Health Service. (See Public Health Service, chapter 1.)

(539) Olympia is a **customs port of entry.**

(540) There are two hospitals in Olympia.

Wharves

(541) The port terminal, owned and operated by the Port of Olympia, is on the E side of the turning basin near the head of West Bay; it is the only deep-draft facility in Olympia Harbor. The port reports that depths of 35 to 40 feet are maintained alongside the terminal's 2,000-foot W face; deck height is 21 feet. Contact the Port of Olympia for the latest controlling depths. The terminal is served by several mobile log handlers ranging from 10- to 45-ton capacity, a rail car switcher, and other modern cargo-handling devices. More than 95,000 square feet of covered and 39 acres of open storage is available.

Supplies

(542) Water, ice, groceries, and some marine supplies can be obtained. Diesel fuel, gasoline, and lubricants are available.

Repairs

(543) Only small craft can be repaired in Olympia. A large marina in the East Bay has a 77-ton lift that can handle craft up to 90 feet long. Machine shops are in the city. For repairs to larger vessels, the nearest facilities are in Seattle, WA.

Small-craft facilities

(544) There are many marinas at Olympia. Berths, electricity, gasoline, diesel fuel, water, ice, launching ramps, storage, and marine supplies are available. Hull and engine repairs can be made at a marina just S of the port wharf. A private yacht club has its moorings at the head of West Bay 0.3 mile S of the turning basin.

Communications

(545) Olympia is served by two major railroads. Olympia Airport is 4.5 miles S of the city.

Chart 18448

(546) **Eld Inlet**, locally known as **Mud Bay,** immediately W of Budd Inlet, is of little commercial importance. It affords good anchorage inside the entrance in 24 to 42 feet, soft bottom. A midchannel course is clear to the flats at its head. In entering, **Cooper Point,** the E point at the entrance, should be given a berth of not less than 0.2 mile. Some logging and oystering are done here.

(547) **Squaxin Passage** (see also chart 18457), S of **Squaxin Island** and **Hope Island,** is about 1 mile long and leads to Totten and Hammersley Inlets. A light on Hunter Point marks the SW entrance point of the passage. The N shore is foul; a shoal covered 19 feet is 150

yards off the W shore of Hope Island abreast Steamboat Island.

(548) The passage is narrow, and strangers should proceed with caution. The S shore should be favored, and, at the W end, the N point of Steamboat Island should be favored. The principal danger in the passage is a reef which bares at extreme low water, SE of Hope Island; a buoy is near its S end. This reef is easily avoided by keeping the N point of Steamboat Island well open of the S point of Hope Island. Tide rips are said to occur in Squaxin Passage. The usual velocity of the current is about 1.5 knots.

(549) The passage between Hope and Squaxin Islands has a least depth of 9 feet in the middle; greater depths can be carried in the passage with local knowledge.

(550) **Steamboat Island,** covered with private homes, is connected with **Carlyon Beach** on the mainland by a roadway on piling. The island, practically a part of the mainland, has abrupt shores and is heavily wooded. The NW end of the island terminates in a long sandspit marked on the end by a daybeacon. A private pier is on the NW side of the island, and a pier and large building of a private yacht club are on Carlyon Beach just E of the roadway on piling.

(551) **Totten Inlet** extends 9 miles SW from the W end of Squaxin Passage. A depth of 30 feet can be carried to a point off the entrance to Skookum Inlet. A 3½-fathom shoal is about in midchannel at the entrance, 620 yards SW of the S end of Steamboat Island. A spit extends W for about 100 yards from Steamboat Island. In entering, favor the W shore to avoid the spit and shoal. The inlet shoals gradually to near **Burns Point,** 100 feet high, on the S shore, where it bares at low tide.

(552) **Oyster Bay,** S of Burns Point, is an extensive mudflat; oysters are grown in this area, and there are log booms. S of the entrance to **Little Skookum Inlet,** along the shores of Totten Inlet, are rock or concrete walls enclosing the oysterbeds. The walls are a danger to navigation, and the oyster industry discourages boatmen from entering these waters. Oyster-processing wharves are on the N side of the inlet. Local knowledge is required to get to them. Good anchorage may be had anywhere inside the entrance of Little Skookum Inlet.

Chart 18457

(553) **Hammersley Inlet** indents the W shore of the sound about 1 mile N of the W end of Squaxin Passage. It is about 6 miles long, expanding at its head into **Oakland Bay,** which is 3.5 miles long in a NE direction. The inlet is obstructed by shoals, particularly at its mouth, where there is an extensive bar. The rocky shoals have been partly removed. The channel, marked by lights on **Libby Point** and **Church Point,** has a controlling depth of about 8 feet to the town of Shelton on Oakland Bay. It is navigated only by small craft, and by tugs with log rafts and railroad car floats; local knowledge is required. Tidal current velocities may reach 5 knots at times in the constricted parts of the inlet. (See Tidal Current Tables for current predictions.) Vessels enter on the flood, usually after half tide, and leave on the ebb, usually before maximum strength. Hammersley Inlet is considered dangerous for strangers.

(554) Vessels with sharp rise of bilge should avoid the inlet as there is danger of capsizing in the strong current in case of grounding.

(555) **Arcadia** is a small settlement on the S point of the entrance of Hammersley Inlet. It has a public ramp for launching small pleasure craft.

(556) **Shelton,** at the head of the inlet, is a town of some commercial importance. Extensive logging, lumber, and lumber product manufacturing interests are centered here. The W end of **Oakland Bay** is used primarily as a storage area for logs trucked in from the Olympic Peninsula to be used by the mills at Shelton. Hammersly Inlet receives little commercial traffic. Shelton is on a branch of the Burlington Northern Railroad; lumber is shipped largely by rail, however, some railroad car ferrying is done. Railway trestles used as log dumps extend E across the flats from the Shelton waterfront. The Port of Shelton marina, 0.3 mile from the head of the Shelton waterfront and on the N shore, has berths, electricity, gasoline, and water. A yacht club has its facilities at the marina. Some marine supplies are available in the town. There are no haulout or repair facilities at Shelton. Oysters are cultivated in the shoal portions of Oakland Bay.